DOCUMENT RESUME

ED 195 815 CE 027 539

AUTHOR	Hughes, Mike; And Others
TITLE	Tobacco Production. A Unit for Teachers of Vocational Agriculture. Production Agriculture Curriculum Materials Project.
INSTITUTION	Kentucky Univ., Lexington. Div. of Vocational Education.
SPONS AGENCY	Kentucky Research Coordinating Unit, Lexington.
REPORT NO	H-S-12-15a
PUB DATE	79
NOTE	255p.: For related documents see CE 027 535-540.
EDRS PRICE	MF01/PC11 Plus Postage.
DESCRIPTORS	*Agricultural Education; *Agricultural Production; *Agricultural Skills; Behavioral Objectives; Check Lists; Competence; Instructional Materials; Job Skills; Learning Activities; Marketing; *Plant Growth; Plant Pathology; Secondary Education; Tables (Data); *Tobacco; Transparencies; *Vocational Education

ABSTRACT

Designed to provide instructional materials for use by vocational agriculture teachers, this unit contains forty-one lessons based upon competencies needed to maximize profits in tobacco production. The lessons in this unit cover such topics as the importance of tobacco, selecting land for tobacco, soil analysis and treatment, selecting tobacco varieties, soil preparation and seeding, insect and disease control, plant cultivation, curing tobacco, marketing, federal regulations for tobacco, and transporting and selling tobacco. Each lesson contains the following: (1) a performance objective, (2) teaching-learning activities, (3) supplementary materials, and (4) a check-out activity. Suggestions for using problem-solving techniques, resource persons, field trips, and audio-visual aids are outlined in the sections on teaching-learning activities provided for each lesson. Transparency masters of charts, tables, and illustrations are included in most lessons. (Related documents contain similar instructional materials on breeding livestock, livestock judging, feeding livestock, dairy housing and equipment, and corn production--see note.) (MN)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED195815

TOBACCO PRODUCTION

A Unit for Teachers of Vocational Agriculture

Developed by:

Mike Hughes
Teacher of Vocational Agriculture
Warren East High School
Bowling Green, Kentucky

Vernon Sutton
Teacher of Vocational Agriculture
Anderson County High School
Lawrenceburg, Kentucky

Jack Wise
Teacher of Agriculture
Clark County High School
Winchester, Kentucky

Supervised by:

Rodney W. Tulloch
Associate Professor and Project Director
University of Kentucky

Supported by:

Research Coordinating Unit
Bureau of Vocational Education
Kentucky Department of Education

1979

CE 027 539

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

N. Sims

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

ACKNOWLEDGEMENTS

We are grateful to the following people for their contributions in completing this unit: Phyliss Dedman, for secretarial service; Sheila Onkst, typing; Pat Schrader and Judy Levine, editing; Gladys Owens and Ray Gilmore, for art work; J. H. Smiley, Agronomy Department, University of Kentucky, who reviewed the unit for technical content; and each of the teacher/writers who reviewed the unit.

Gratitude also goes to Lou Perry, Robert Kelley, Jewell Deene Ellis, Steve Davis, Melissa Briscoe, and Charles Wade of the Bureau of Vocational Education, State Department of Education; and Harold Binkley, Herbert Bruce, Charles Byers, and John Dickens of the Department of Vocational Education, University of Kentucky, as well as all the joint State Staff in Agricultural Education for their support throughout the development of this and other units for teachers of vocational agriculture.

We also wish to thank the many writers, publishers, and governmental agencies who furnished materials and references for use in the project.

GROWING TOBACCO

Number of Class Periods ___________ Month(s) ___________

Introduction

Maximizing profits in tobacco production requires competence in many areas. Determining the competencies required for growing tobacco is an important but difficult job. Fortunately, this job has already been done as part of the National Agricultural Occupations Competency Study. Those results are the basis for the competencies used in this unit. Additional competencies have been included based on community needs established as necessary by the authors of this unit. Since in the validation of the competencies by incumbent workers the importance of the competencies were rated, you the teacher have solid data on which to base what is taught, an indication of how much time to spend on it, and what can be eliminated. (See National Agricultural Occupations Competency Study for ratings.) A person who grows tobacco is a tobacco farmer. Other similar job titles are tobacco grower and tobacco producer. The job description is as follows:

> A tobacco farmer is a person competent in both managerial and decision-making skills and in the carrying out of the necessary technically-improved (approved) practices which result in high yields of quality tobacco. Significant competencies are needed by both the owner-producer and the tenant-producer. Examples of the broad areas of work (competency areas) tobacco farmers perform are: planning to grow tobacco; producing a plentiful supply of sturdy, healthy plants; growing the tobacco, which includes fertilizing, preparing the land, tillage practices, and controlling insects, diseases and suckers; harvesting, housing, and curing the crop; and stripping and marketing.

Competencies identified and validated, or lessons included in this unit, are as follows:

1. Importance of Tobacco
2. Selecting Land for Tobacco
3. Selecting the Plantbed Site
4. Taking a Soil Sample and Sending it for Analysis
5. Correcting the pH Level of Soil
6. Preparing and Treating the Tobacco Plantbed for Weed Control
7. Selecting a Variety of Tobacco
8. Preparing, Fertilizing, and Seeding Tobacco Plantbeds
9. Selecting and Using Tobacco Plantbed Covers
10. Controlling Insects in the Plantbed
11. Controlling Diseases in the Tobacco Plantbed
12. Checking Plantbeds Regularly
13. Regulating the Growth of Tobacco Plants in the Tobacco Plantbed

14. Preparing the Tobacco Plantbed for Pulling Plants
15. Handling Tobacco Plants from Pulling to Transplanting
16. Preparing the Tobacco Plantbed for the Next Year
17. Changing Soil Fertility Levels for Tobacco Production
18. Determining Fertilizer Requirements for Tobacco Soil
19. Preparing Soil for Tobacco Transplants
20. Utilizing Farm Residues
21. Using Chemicals to Control Weeds in the Tobacco Field
22. Controlling Insects in the Tobacco Field
23. Transplanting Tobacco
24. Cultivating Tobacco
25. Controlling Diseases in the Tobacco Field
26. Topping Tobacco
27. Controlling Suckers in Tobacco
29. Dropping Sticks and Cutting Tobacco
30. Hauling and Housing Tobacco in the Barn
31. Curing Tobacco With Air
32. Curing Tobacco Using Heat
33. Seeding With a Cover Crop
34. Preparing the Stripping Room
35. Selecting Marketing Method
36. Bulking Tobacco
37. Stripping and Grading According to Market Demand
38. Handling Tobacco From Stripping to Marketing
39. Selecting Markets
40. Federal Regulations for Tobacco
41. Transporting Tobacco to Market and Selling Tobacco

Directions

Each competency which has been validated is listed, followed by: 1) a performance objective, 2) teaching-learning activities, 3) supplementary materials, and 4) a check-out activity. Since all of these competencies are necessary to successful growing of tobacco, all should be taught unless local circumstances or previous learnings would cause this to be unnecessary. These competencies are listed in the order they are carried out to produce a crop, and it is recommended that they be taught in this sequence.

1. IMPORTANCE OF TOBACCO

1.1 Performance Objective

Given a written check-out activity concerning the importance of tobacco, the students will complete the activity with 80 percent accuracy.

1.2 Teaching-Learning Activities

a. This section on the importance of tobacco can best be taught using the problem-solving procedure. Prepare appropriate problems for class use.

b. Take a field trip and observe such things as acreages of tobacco produced, size of business at warehouses, and volume of product sold.

c. Make and use transparencies and/or handouts from transparency masters at the end of this section.

d. Use extension personnel, tobacco farmers, or tobacco marketing/processing personnel as resource persons.

e. Have some of the better students, students with special interests in tobacco or history, read and report on Tobacco and Kentucky.

1.2.1 Importance of tobacco in the United States.

Burley tobacco, often known as "The Golden Leaf," is virtually worth its weight in gold to the American economy. It is of high economic importance to individuals, to communities, to states and to the nation. (See transparency master 1.2.1a.)

Tobacco is a major source of income for some 625,000 American farmers in 23 states. It produces over two billion dollars annually for these farmers and their families, and is worth $16.1 billion to the national economy. (See transparency masters 1.2.1b, 1.2.1c, 1.2.1d, 1.2.1e, 1.2.1f, and 1.2.1g.)

Ever since the first Surgeon General's report on smoking and health, there have been increased efforts and regulations aimed at controlling the use of tobacco. Legislation has been enacted requiring strong warnings on cigarette packages and also completely banning cigarette advertising from radio and television. Despite these restrictions, the consumption of cigarettes and other tobacco products has remained high. (See transparency masters 1.2.1h and 1.2.1i.)

1.2.2 Importance of tobacco as a cash crop in Kentucky. (See transparency masters 1.2.2a, 1.2.2b, 1.2.2c, 1.2.2d, 1.2.2e, 1.2.2f, 1.2.2g, and 1.2.2h.)

Tobacco is the major cash crop on many farms in Kentucky. In recent years tobacco accounts for one-third to one-half of the cash receipts from farming for the state as a whole. Tobacco has provided and continues to provide a livelihood for many Kentucky farm families.

Because of its high value per acre, tobacco is particularly important on small- and medium-sized farms, of which Kentucky has a very large number (100,000+). Much of the land in the state is hilly and rolling and erodes easily; it should, therefore, be kept in sod crops most of the time. A crop like tobacco makes this possible.

About 21 percent of all the tobacco grown in the United States is raised in Kentucky. Nearly 70 percent of all burley grown is produced on Kentucky farms.

1.2.3 Importance of tobacco in the farm business.

Tobacco returns more cash farm income to Kentucky farmers than any other commodity. Tobacco is an intensive crop, which means it requires little land and much labor. Its money value per acre, however, is very high. Tobacco fits well in a diversified farming program. Its use of land, labor and capital combine well with other farm enterprises.

1.3 Supplementary Materials

References:
1. Kentucky Agricultural Statistics.
2. The Golden Leaf.
3. Tobacco and Kentucky.
4. Tobacco Institute Profile.
5. Tobacco in the United States, Misc. Publication 867.
6. 1978 Handbook of Agricultural Charts.

Transparency Masters:
1. 1.2.1a, "Where The Tobacco User's Dollar Goes."
2. 1.2.1b, "Burley Tobacco: Supply in the United States."
3. 1.2.1c, "Burley Tobacco: Price in the United States."
4. 1.2.1d, "Burley Tobacco: Use in the United States."

5. 1.2.1e, "Flue-Cured Tobacco: Supply in the United States."

6. 1.2.1f, "Flue-Cured Tobacco: Price in the United States."

7. 1.2.1g, "Flue-Cured Tobacco: Use in the United States."

8. 1.2.1h, "Tobacco Use by Kind."

9. 1.2.1i, "Cigarettes Produced and Tobacco Used."

10. 1.2.2a, "Burley Tobacco."

11. 1.2.2b, "Burley Tobacco County Estimates, 1978."

12. 1.2.2c, "Dark-Fired Tobacco."

13. 1.2.2d, "Dark Air-Cured Tobacco."

14. 1.2.2e, "Dark Air-Cured Tobacco County Estimates, 1978."

15. 1.2.2f, "Distribution of Crop Values: 1978."

16. 1.2.2g, "Kentucky Crops Ranked According to 1978 Value of Production."

17. 1.2.2h, "Kentucky Cash Receipts From Farm Marketing, 1976-1978."

18. 1.2.2i, "Kentucky Tobacco: All Tobacco Acres Harvested, 1950-1978."

19. 1.2.2j, "Kentucky Tobacco: Burley Tobacco Yield, 1950-1978."

20. 1.2.2k, "Kentucky Tobacco: Percent of Burley Set 74-78 Average."

21. 1.2.2l, "Kentucky Tobacco: Percent of Burley Cut 74-78 Average."

1.4 Check-Out Activities

Provide students with the following exercise:

1. Burley tobacco is often known as __________.
2. How much is tobacco worth to the national economy?

3. Despite all restrictions, the consumption of cigarettes and other tobacco products has remained high. T F

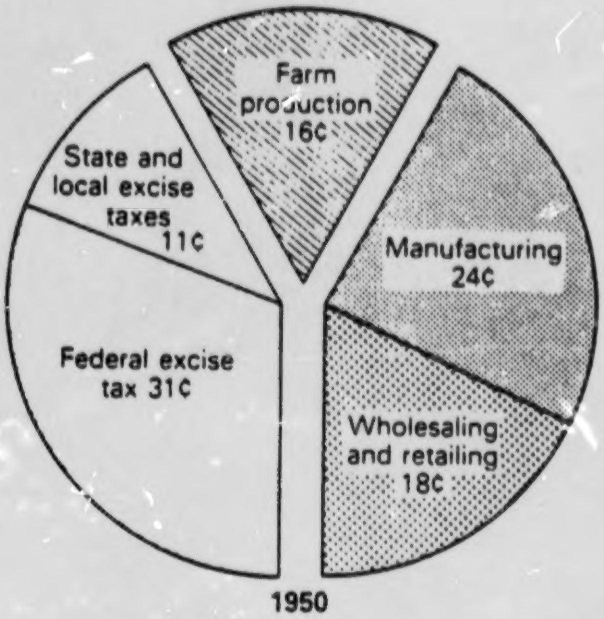
4. Kentucky produces nearly __________ percent of all tobacco grown in the U. S.

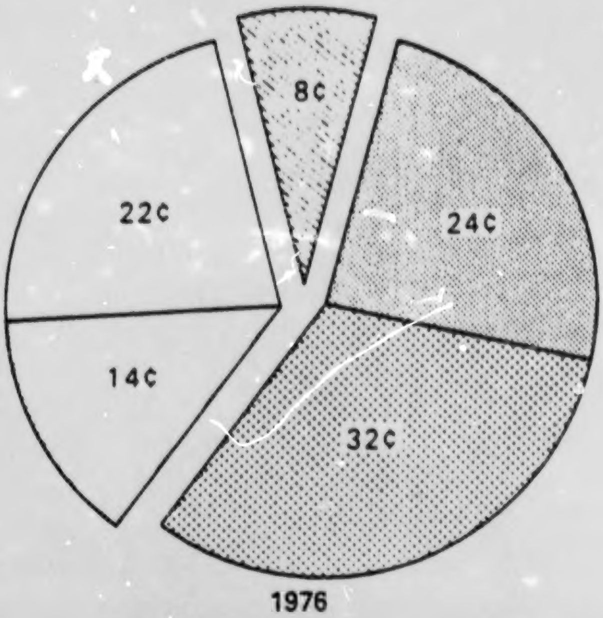
5. Tobacco fits well into a diversified farming program? T F

ANSWERS:

1. "The Golden Leaf"
2. $16.1 billion dollars
3. True
4. 21 percent
5. True

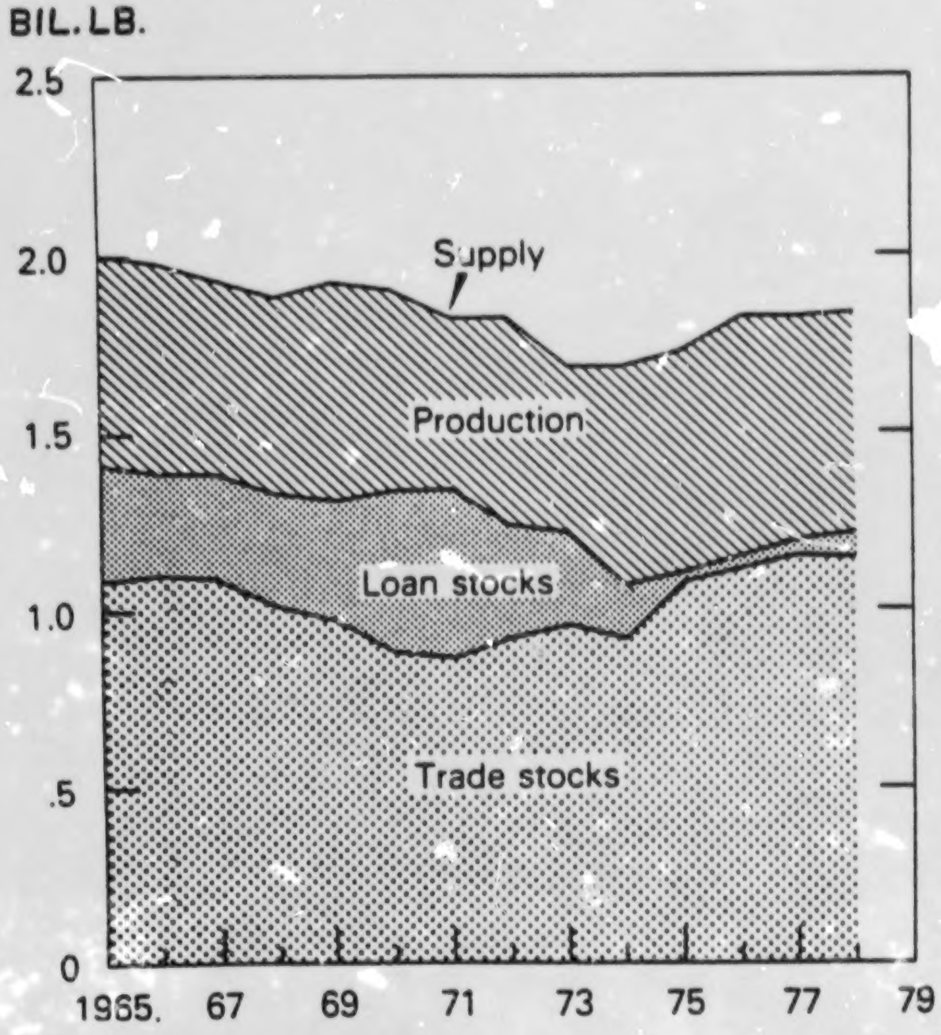
WHERE THE TOBACCO USER'S DOLLAR GOES





Source: 1978 Handbook of Agricultural Charts.

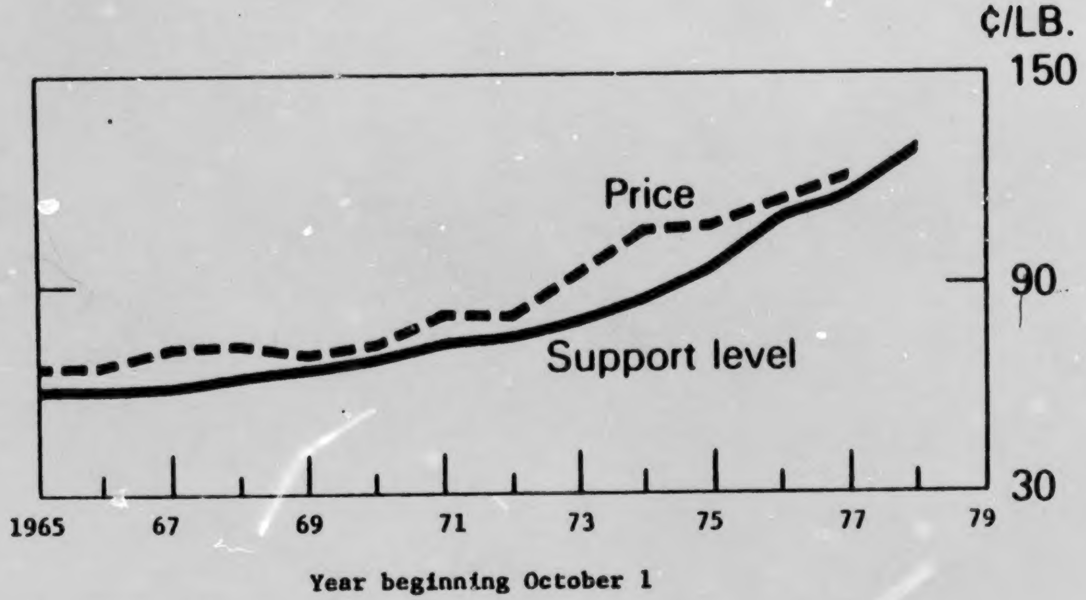
BURLEY TOBACCO: SUPPLY IN THE UNITED STATES



Year beginning October 1

Source: 1978 Handbook of Agricultural Charts.

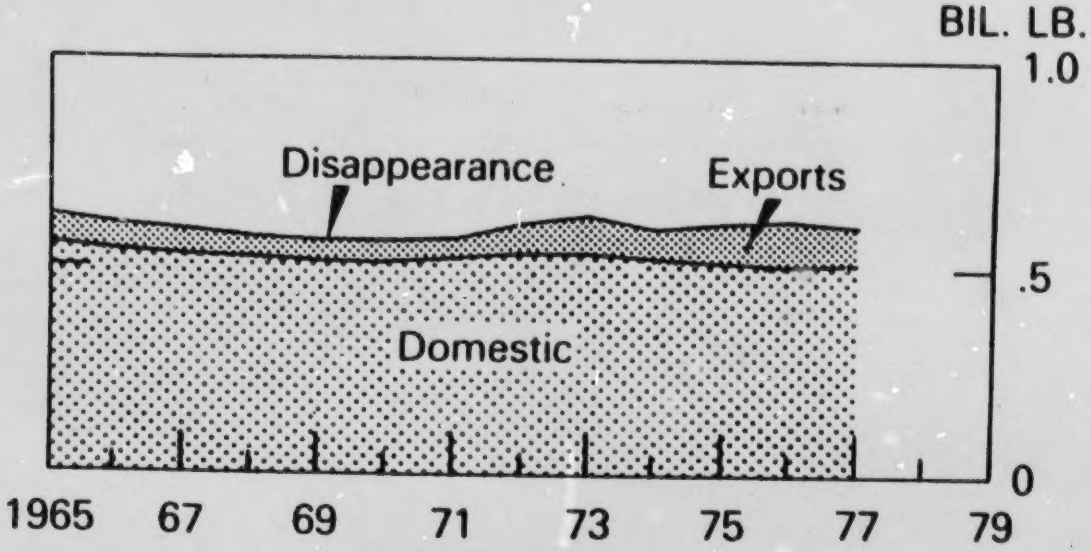
BURLEY TOBACCO: PRICE IN THE UNITED STATES



Source: 1978 Handbook of Agricultural Charts.

TM 1.2.1c

BURLEY TOBACCO: USE IN THE UNITED STATES

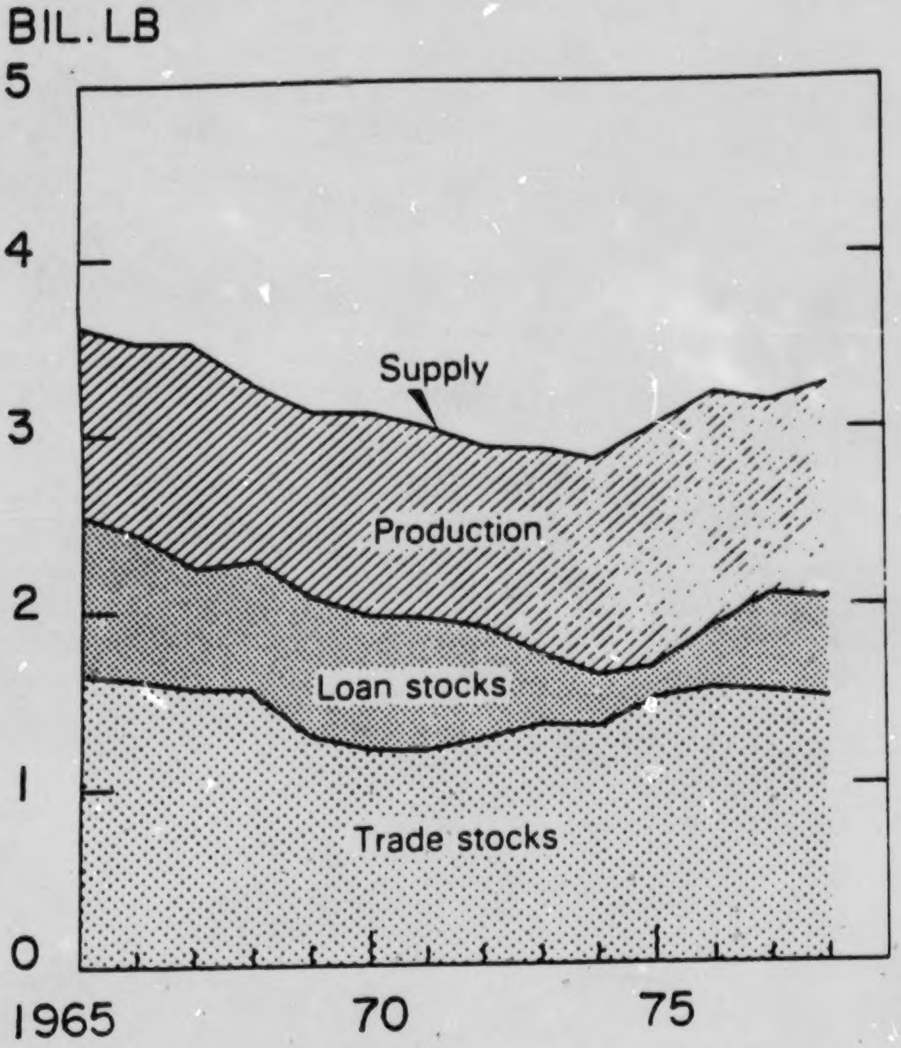


Year beginning October 1

TM 1.2.1d

Source: 1978 Handbook of Agricultural Charts.

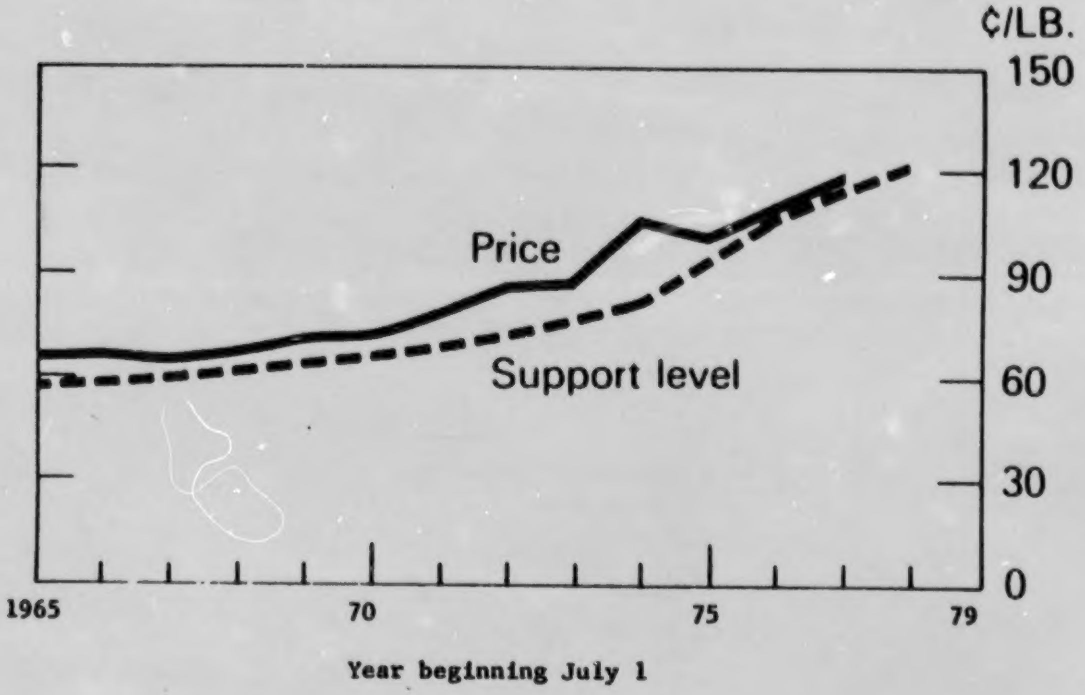
FLUE-CURED TOBACCO: SUPPLY IN THE UNITED STATES



Year beginning July 1

Source: 1978 Handbook of Agricultural Charts.

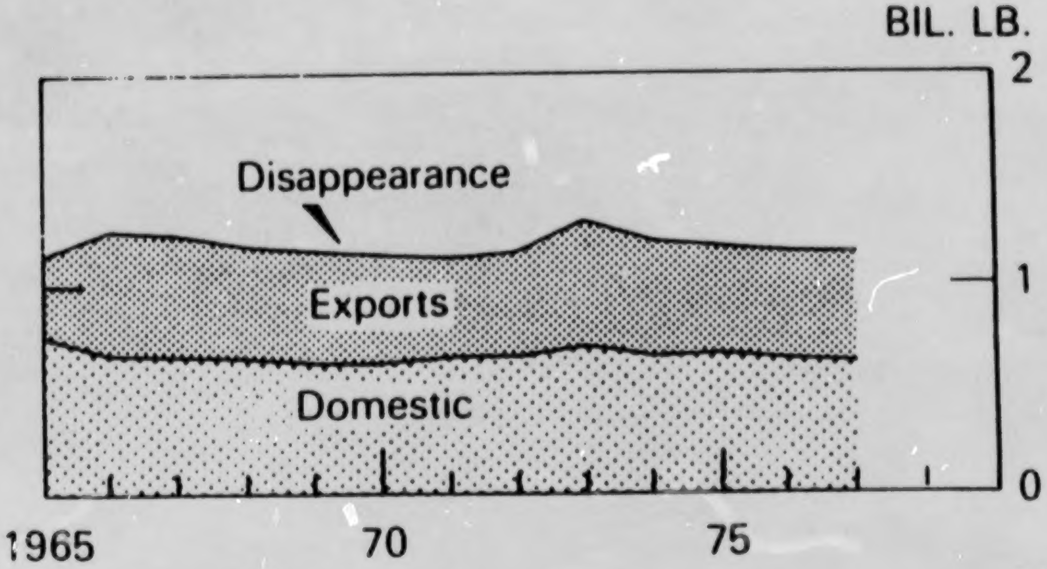
FLUE-CURED TOBACCO: PRICE IN THE UNITED STATES



Source: 1978 Handbook of Agricultural Charts.

TM 1.2.1f

FLUE-CURED TOBACCO: USE IN THE UNITED STATES

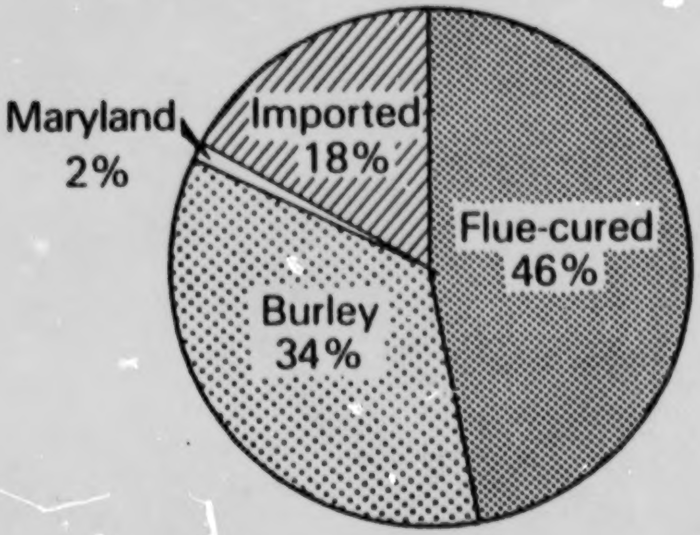


Year beginning July 1

TM 1.2.18

Source: 1978 Handbook of Agricultural Charts.

TOBACCO USE BY KIND

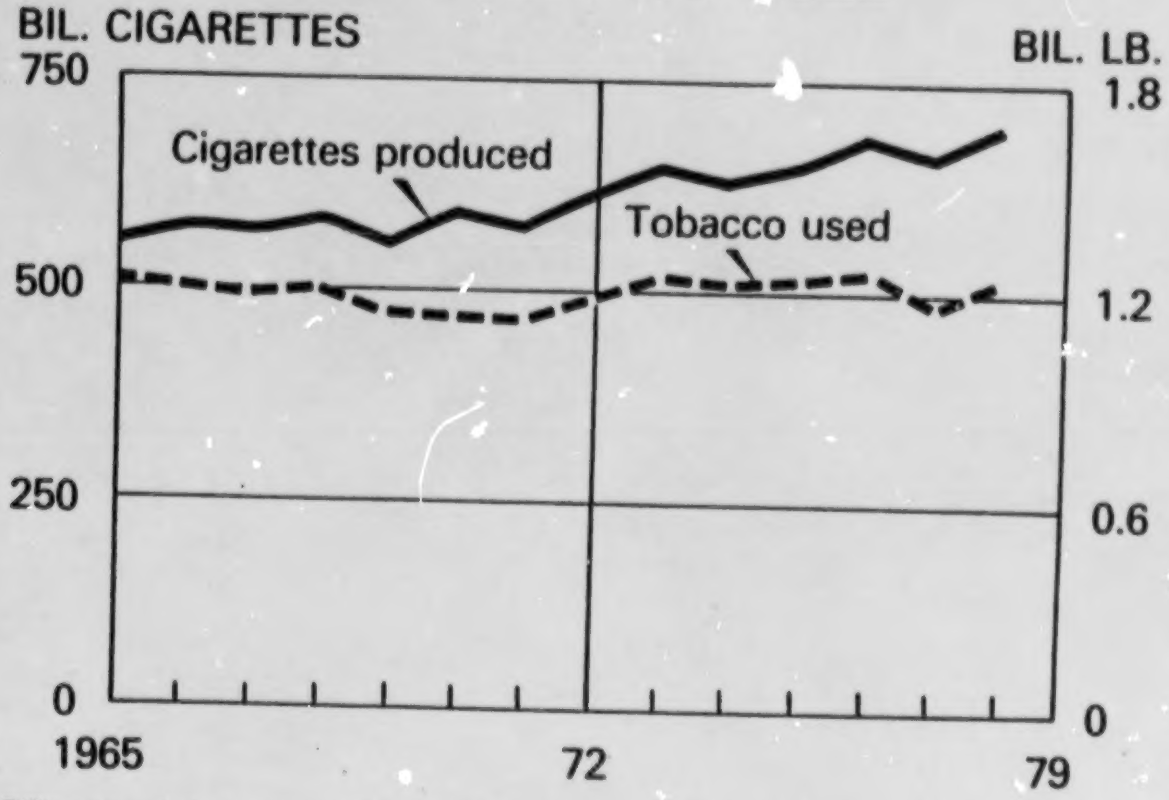


1973-76 Average

TM 1.2.1h

Source: 1978 Handbook of Agricultural Charts.

CIGARETTES PRODUCED AND TOBACCO USED



Billion pounds in unstemmed processing weight. 1978 preliminary.

Source: 1978 Handbook of Agricultural Charts.

TM 1.2.11

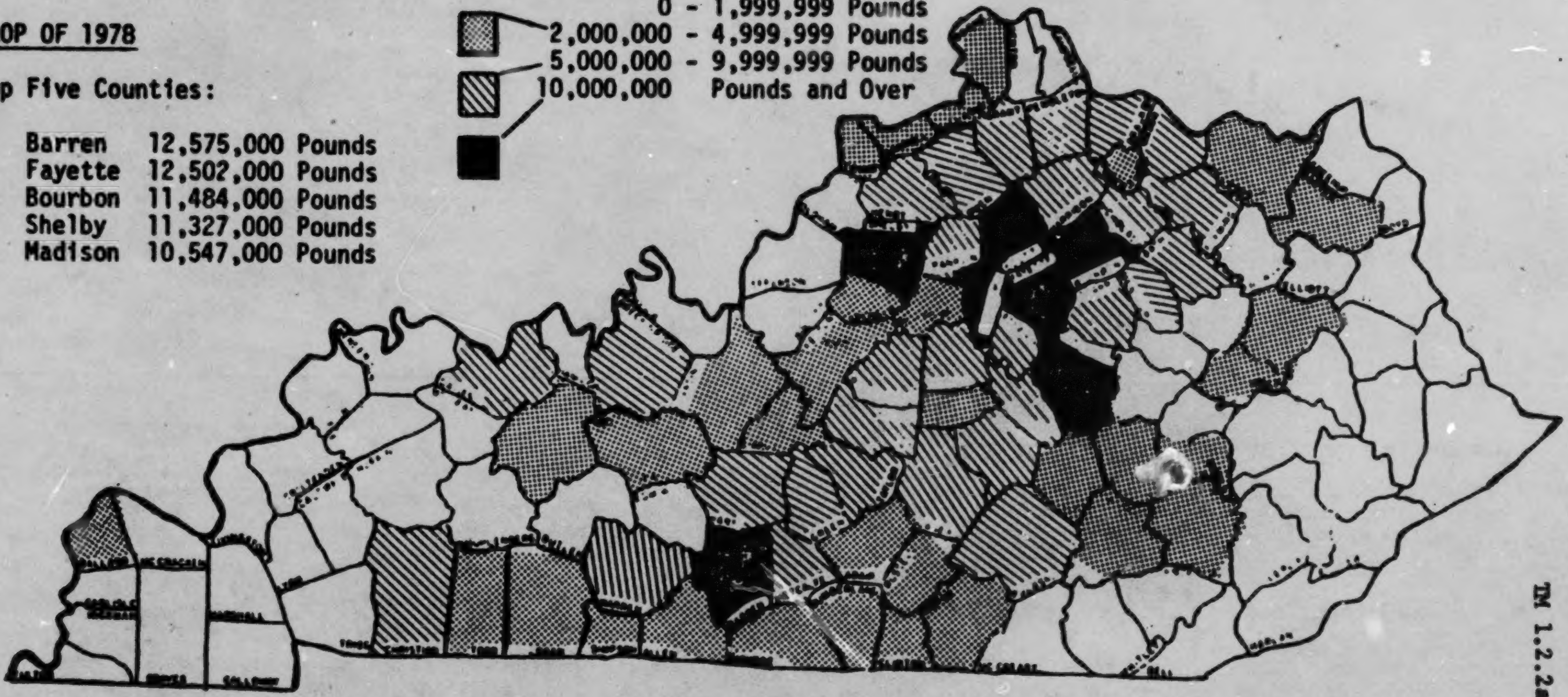
BURLEY TOBACCO

CROP OF 1978

Top Five Counties:

1.	Barren	12,575,000 Pounds
2.	Fayette	12,502,000 Pounds
3.	Bourbon	11,484,000 Pounds
4.	Shelby	11,327,000 Pounds
5.	Madison	10,547,000 Pounds

☐ 0 - 1,999,999 Pounds
▒ 2,000,000 - 4,999,999 Pounds
▨ 5,000,000 - 9,999,999 Pounds
■ 10,000,000 Pounds and Over



Source: Kentucky Agricultural Statistics: 1978-1979.

TM 1.2.2b

BURLEY TOBACCO COUNTY ESTIMATES 1978

District and County	Harv. Acres	Yield Per Acre (Pounds)	Production (Pounds)
Ballard	1,280	2,450	3,136,000
Calloway	255	2,075	529,000
Carlisle	275	2,475	681,000
Graves	425	2,250	956,000
Hickman	30	2,200	66,000
Lyon	200	2,250	450,000
McCracken	555	2,350	1,304,000
Marshall	185	2,275	421,000
Trigg	750	2,325	1,744,000
Other Counties	5	2,250	11,000
DISTRICT 1	3,960	2,348	9,296,000
Caldwell	535	2,300	1,231,000
Christian	2,700	2,350	6,345,000
Crittenden	5	2,300	11,000
Daviess	2,970	2,575	7,648,000
Hancock	1,030	2,500	2,575,000
Henderson	305	2,300	702,000
Hopkins	105	1,975	207,000
Logan	1,540	2,350	3,619,000
McLean	675	2,450	1,654,000
Muhlenberg	420	2,490	1,046,000
Ohio	1,100	2,450	2,695,000
Simpson	860	2,375	2,043,000
Todd	1,150	2,390	2,749,000
Union	5	2,200	11,000
Webster	95	1,950	185,000
DISTRICT 2	13,495	2,425	32,721,000
Adair	2,050	2,390	4,900,000
Allen	1,520	2,375	3,610,000
Barren	5,030	2,500	12,575,000
Breckinridge	2,970	2,425	7,202,000
Bullitt	570	2,400	1,368,000
Butler	380	2,200	836,000
Casey	2,450	2,550	6,248,000
Clinton	970	2,400	2,328,000
Cumberland	1,030	2,475	2,549,000
Edmonson	770	2,450	1,887,000
Grayson	1,580	2,400	3,792,000
Green	2,430	2,550	6,197,000
Hardin	1,850	2,400	4,440,000
Hart	3,500	2,525	8,838,000
Jefferson	280	2,300	644,000
Larue	1,280	2,475	3,168,000
Marion	2,100	2,675	5,618,000
Meade	800	2,325	1,860,000
Metcalfe	2,260	2,475	5,594,000
Monroe	1,520	2,475	3,762,000
Nelson	1,850	2,450	4,533,000
Russell	1,490	2,425	3,613,000
Taylor	2,150	2,600	5,590,000
Warren	2,650	2,350	6,228,000
DISTRICT 3	43,480	2,470	107,380,000
Boone	1,250	2,300	2,875,000
Bracken	2,580	2,450	6,321,000
Campbell	300	2,475	743,000
Carroll	1,510	2,500	3,775,000
Gallatin	840	2,590	2,176,000
Grant	2,290	2,560	5,862,000
Henry	3,580	2,700	9,666,000
Kenton	620	2,350	1,457,000
Oldham	650	2,300	1,495,000
Owen	3,070	2,600	7,982,000
Pendleton	2,050	2,460	5,043,000
Trimble	1,370	2,650	3,631,000
DISTRICT 4	20,110	2,537	51,026,000
Anderson	1,350	2,425	3,274,000
Bath	2,480	2,420	6,002,000
Bourbon	4,400	2,610	11,484,000
Boyle	1,740	2,575	4,481,000
Clark	2,830	2,470	6,990,000
Fayette	4,700	2,660	12,502,000
Fleming	3,060	2,360	7,222,000
Franklin	2,400	2,460	5,904,000
Garrard	2,830	2,595	7,344,000
Harrison	3,520	2,610	9,187,000
Jessamine	2,740	2,480	6,795,000
Lincoln	2,630	2,530	6,654,000
Madison	4,120	2,560	10,547,000
Mason	3,570	2,460	8,782,000
Mercer	2,700	2,410	6,507,000
Montgomery	2,430	2,510	6,099,000
Nicholas	2,190	2,460	5,387,000
Robertson	1,000	2,460	2,460,000
Scott	3,860	2,660	10,268,000
Shelby	4,340	2,610	11,327,000
Spencer	1,720	2,400	4,128,000
Washington	2,700	2,525	6,818,000
Woodford	3,990	2,610	10,414,000
DISTRICT 5	67,300	2,535	170,576,000
Bell	5	2,200	11,000
Boyd	25	2,175	54,000
Breathitt	560	2,350	1,316,000
Carter	1,440	2,300	3,312,000
Clay	1,240	2,425	3,007,000
Elliott	920	2,100	1,932,000
Estill	690	2,300	1,587,000
Greenup	850	2,325	1,976,000
Jackson	1,430	2,430	3,475,000
Johnson	270	2,200	594,000
Knox	410	2,300	943,000
Laurel	2,050	2,400	4,920,000
Lawrence	300	2,275	683,000
Lee	280	2,350	658,000
Leslie	30	1,900	57,000
Lewis	2,100	2,100	4,410,000
McCreary	30	2,200	66,000
Magoffin	810	2,110	1,709,000
Menifee	640	2,275	1,456,000
Morgan	1,680	2,275	3,822,000
Owsley	850	2,400	2,040,000
Perry	35	1,900	67,000
Powell	460	2,000	920,000
Pulaski	3,080	2,525	7,777,000
Rockcastle	1,450	2,450	3,553,000
Rowan	620	2,200	1,364,000
Wayne	1,230	2,350	2,891,000
Whitley	220	2,200	484,000
Wolfe	945	2,200	2,079,000
Other Counties	5	2,100	11,000
DISTRICT 6	24,655	2,319	57,174,000
STATE	173,000	2,475	428,175,000

Source: Kentucky Agricultural Statistics: 1978-1979.

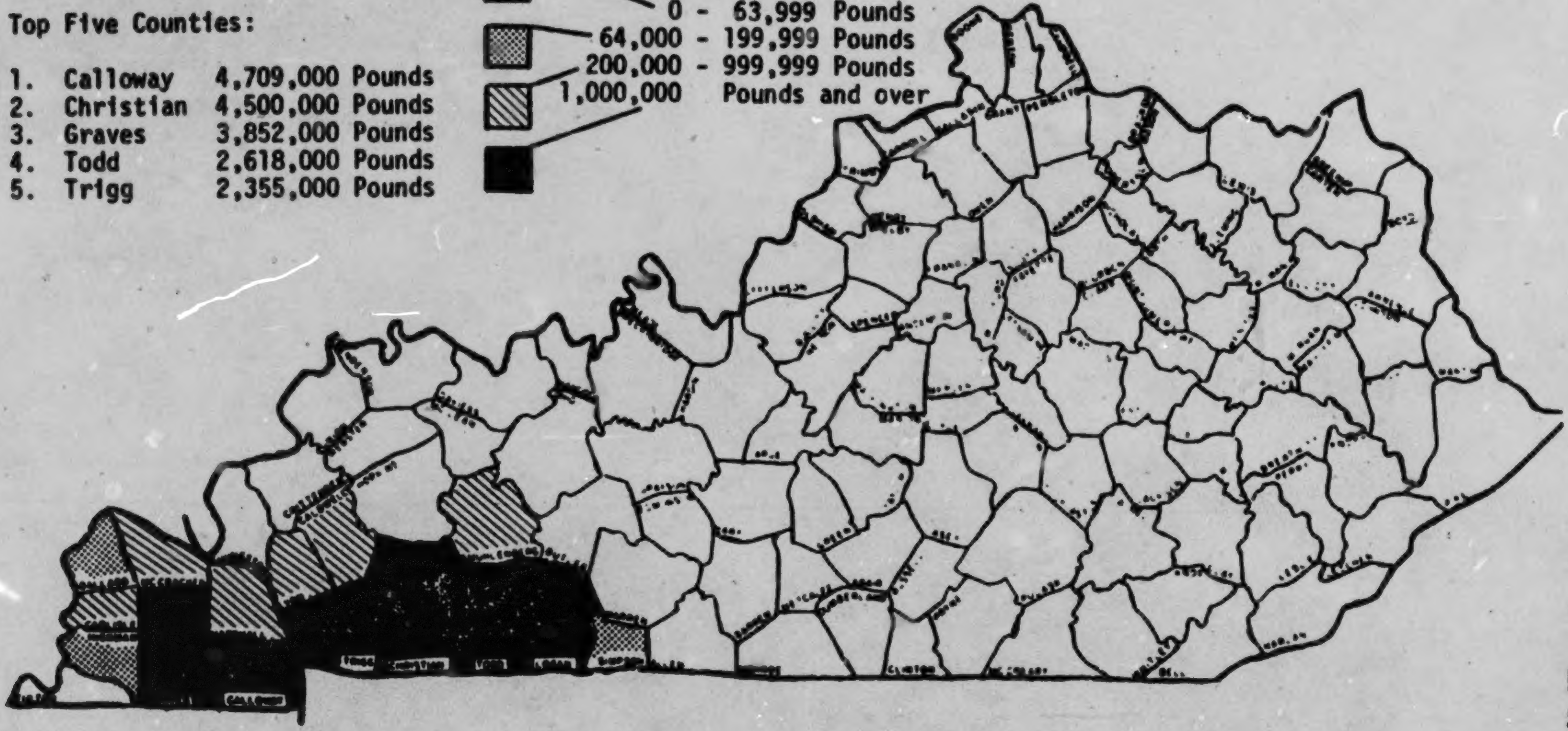
DARK-FIRED TOBACCO

CROP OF 1978

Top Five Counties:

1.	Calloway	4,709,000 Pounds
2.	Christian	4,500,000 Pounds
3.	Graves	3,852,000 Pounds
4.	Todd	2,618,000 Pounds
5.	Trigg	2,355,000 Pounds

☐ 0 - 63,999 Pounds
▩ 64,000 - 199,999 Pounds
▨ 200,000 - 999,999 Pounds
■ 1,000,000 Pounds and over



Source: Kentucky Agricultural Statistics: 1978-1979.

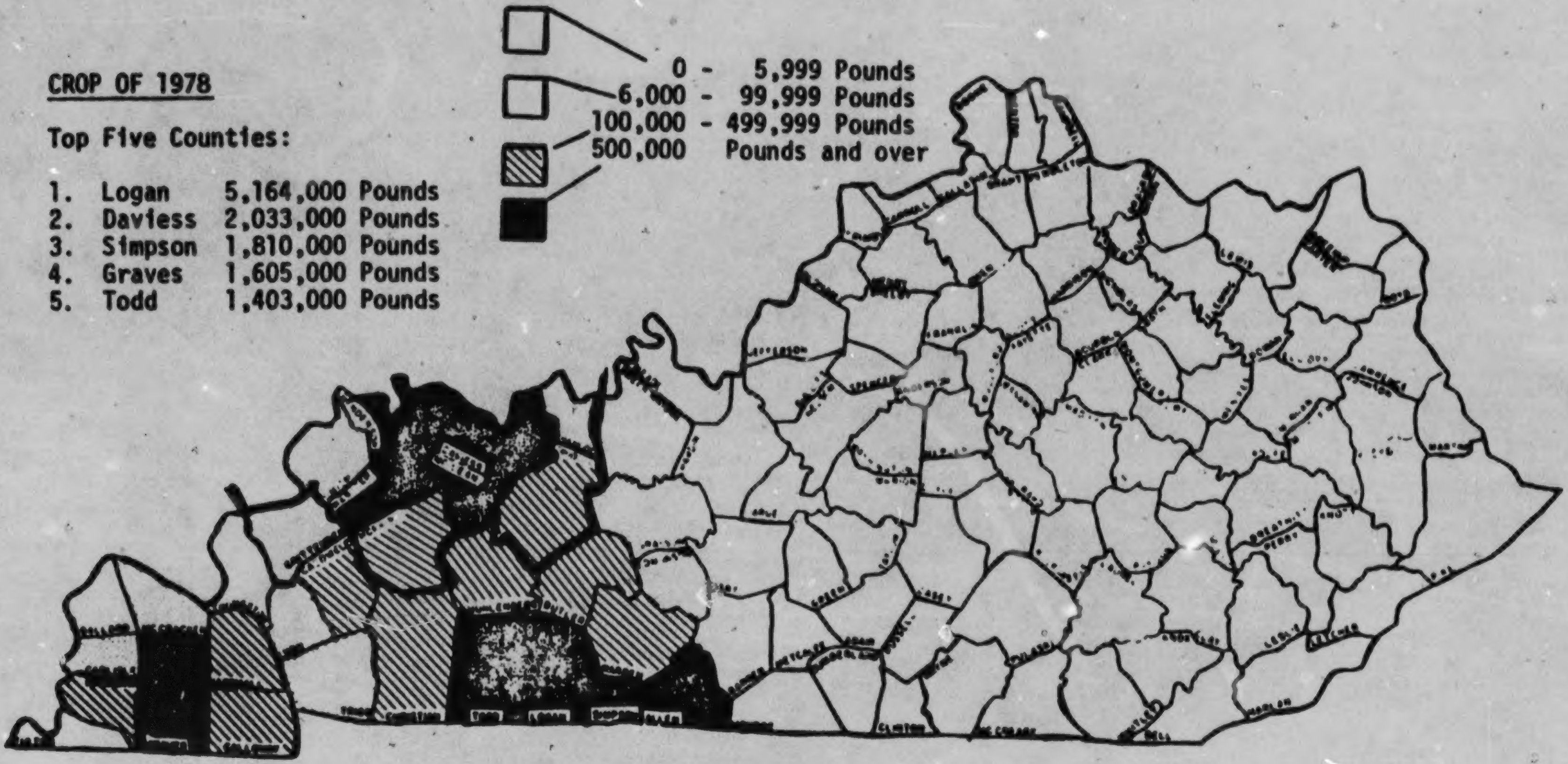
TM 1.2.2c

DARK AIR-CURED TOBACCO

CROP OF 1978

Top Five Counties:

1.	Logan	5,164,000 Pounds
2.	Daviess	2,033,000 Pounds
3.	Simpson	1,810,000 Pounds
4.	Graves	1,605,000 Pounds
5.	Todd	1,403,000 Pounds


☐ 0 - 5,999 Pounds
☐ 6,000 - 99,999 Pounds
▨ 100,000 - 499,999 Pounds
■ 500,000 Pounds and over

Source: Kentucky Agricultural Statistics: 1978-1979.

TM 1.2.2d

TM 1.2.2e

DARK AIR-CURED TOBACCO COUNTY ESTIMATES 1978

TYPE 35 (ONE SUCKER)

County	Acres Harvested	Yield Per Acre (pounds)	Production (pounds)
Allen	265	2,040	541,000
Butler	110	1,900	209,000
Caldwell	95	1,920	182,000
Calloway	145	2,050	297,000
Carlisle	50	1,860	93,000
Christian	80	2,190	175,000
Graves	750	2,140	1,605,000
Hickman	50	2,020	101,000
Logan	2,550	2,025	5,164,000
Lyon	30	2,110	63,000
McCracken	10	2,140	21,000
Marshall	75	1,910	143,000
Muhlenberg	150	1,875	281,000
Simpson	1,000	1,810	1,810,000
Todd	705	1,990	1,403,000
Trigg	35	2,200	77,000
Warren	195	2,180	425,000
Other Counties	5	2,020	10,000
STATE TOTAL	6,300	2,000	12,600,000

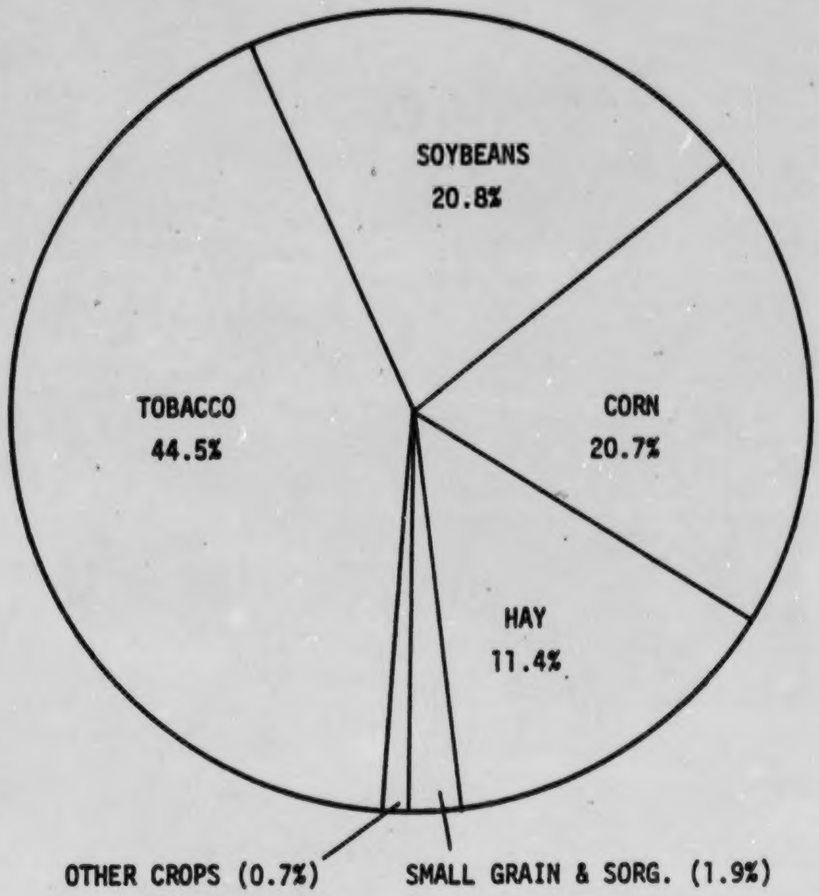
TYPE 36 (GREEN RIVER)

County	Acres Harvested	Yield Per Acre (pounds)	Production (pounds)
Daviess	1,120	1,815	2,033,000
Hancock	25	2,240	56,000
Henderson	520	1,725	897,000
Hopkins	210	1,700	357,000
McLean	620	2,195	1,361,000
Ohio	230	2,140	492,000
Union	15	1,710	26,000
Webster	400	1,785	714,000
Other Counties	10	1,800	18,000
STATE TOTAL	3,150	1,890	5,954,000

Source: Kentucky Agricultural Statistics: 1978-1979.

DISTRIBUTION OF CROP VALUES

1978



Source: Kentucky Agricultural Statistics: 1978-1979.

KENTUCKY CROPS RANKED ACCORDING TO 1978 VALUE OF PRODUCTION

Rank Commodity and Unit	1978 CROP YEAR 1/		1977 CROP YEAR		Change in Value
	Premilinary Price	Value	Price	Value	
	Dollars	(000) Dollars	Dollars	(000) Dollars	1978 as % of 1977
1. Tobacco, All, Lb.	1.293	607,202	1.220	551,578	110
2. Soybeans, Bu.	6.70	283,410	6.18	252,886	112
3. Corn (for grain), Bu.	2.35	281,648	2.19	289,737	97
4. Hay, Ton	49.00	154,938	47.00	145,371	107
5. Wheat, Bu.	3.15	21,499	2.10	21,290	101
6. Sorghum Grain, Bu.	1.82	2,595	1.66	3,028	86
7. Peaches, Lb.	.200	2,200	.146	15	
8. Tall Fescue Seed, Cwt.	16.50	1,871	27.50	1,097	171
9. Commercial Apples, Lb.	.126	1,789	.107	2,119	84
10. Barley, Bu.	1.65	1,632	1.50	1,725	95
11. Bell Peppers, Cwt. 2/	8.36	1,271	7.71	1,759	72
12. Vegetables, for Processing 3/	---	1,012	---	1,357	75
13. Popcorn 4/, Cwt.	7.75	998	8.00	2,283	44
14. Oats, Bu.	1.95	573	1.75	551	104
15. Lespedeza Seed, Cwt.	55.00	392	59.00	425	92
16. Rye, Bu.	2.60	281	1.95	211	133
17. Red Clover Seed, Cwt.	69.00	171	73.00	321	53
18. Orchardgrass Seed, Cwt.	34.00	71	34.00	57	125
19. Cotton, Lb. 5/	---	---	.490	165	
TOTAL		1,363,553		1,275,975	

1/ Preliminary. 2/ Fresh Market and Processing. 3/ Commercial Production - including snap beans, cucumbers for pickles, and tomatoes for processing. 4/ Shelled corn basis. 5/ Includes allowances for unredeemed loans. (None Harvested in 1978).

Source: Kentucky Agricultural Statistics: 1978-1979.

KENTUCKY CASH RECEIPTS FROM FARM MARKETING, 1976 - 1978

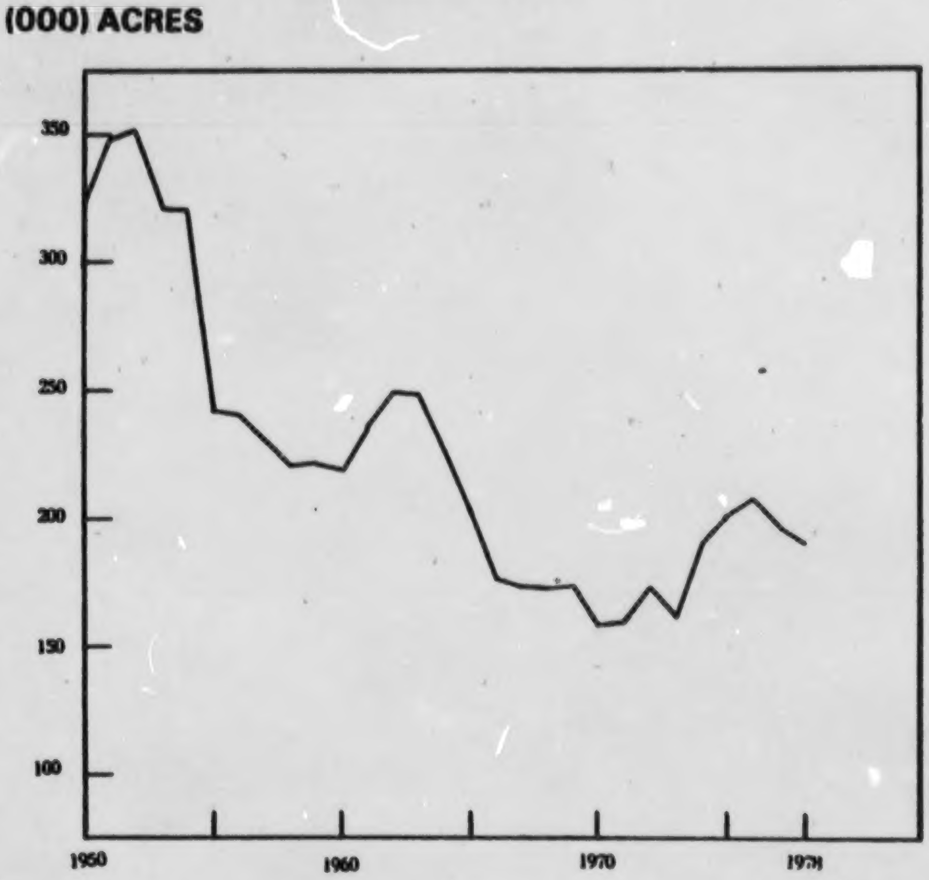
Commodity	1976		1977		1978 *		1978 as % of 1977
	Cash Receipts ($1,000)	% of Total	Cash Receipts ($1,000)	% of Total	Cash Receipts ($1,000)	% of Total	
LIVESTOCK & PRODUCTS	730,121	44.2	730,639	42.2	999,796	49.0	137
Cattle & Calves	334,811	20.3	343,081	19.8	576,277	28.2	168
Dairy Products	212,853	12.9	217,865	12.6	225,027	11.0	103
Hogs	129,953	7.9	122,786	7.1	150,484	7.4	123
Eggs	23,702	1.4	22,141	1.3	21,575	1.1	97
Broilers	5,026	.3	2,908	.2	3,042	.1	105
Sheep & Lambs	1,157	.1	893	.1	935	.1	105
Wool	102	-	120	-	106	-	88
Farm Chickens	1,089	.1	1,000	.1	762	-	76
Other Livestock Products 1/	21,428	1.3	19,845	1.2	21,588	1.1	109
CROPS	922,318	55.8	999,353	57.8	1,040,131	51.0	104
Tobacco	521,599	31.6	619,202	35.8	542,211	26.6	88
Corn	160,209	9.7	144,552	8.4	158,299	7.8	110
Soybeans	162,639	9.8	154,953	9.0	263,894	13.0	170
Wheat	19,447	1.2	20,446	1.2	11,505	.6	56
Hay	11,157	.7	13,085	.8	10,065	.5	77
Fescue Seed	642	-	1,097	.1	1,042	.1	95
Lespedeza Seed	656	-	563	-	364	-	65
Popcorn	4,495	.3	2,633	.2	1,261	.1	48
Bell Peppers	1,355	.1	1,486	.1	1,271	.1	86
Orchardgrass Seed	42	-	50	-	63	-	126
Red Clover Seed	338	-	275	-	170	-	62
Sorghum Grain	1,487	.1	1,740	.1	993	.1	57
Tomatoes	1,120	.1	1,343	.1	299	-	22
Other Field Crops	10,317	.6	10,012	.6	11,045	.5	110
Apples	1,653	.1	2,246	.1	1,945	.1	87
Peaches	1,300	.1	146	-	2,100	.1	1,438
Strawberries	950	.1	1,620	.1	893	-	55
Other Fruits & Nuts	1,776	.1	2,504	.1	2,769	.1	111
Forest Products	9,815	.6	9,400	.5	16,742	.8	178
Greenhouse & Nursery	11,321	.7	12,000	.7	13,200	.6	110
ALL COMMODITIES	1,652,439		1,729,992		2,039,927		118

- Indicates less than .05%. Percent may not be accurate to .1 in last place because of method of machine computation. * Preliminary. 1/ Other poultry, honey, beeswax, horses, mules and mink skins.

Source: Kentucky Agricultural Statistics: 1978-1979.

KENTUCKY TOBACCO

ALL TOBACCO ACRES HARVESTED
1950-1978



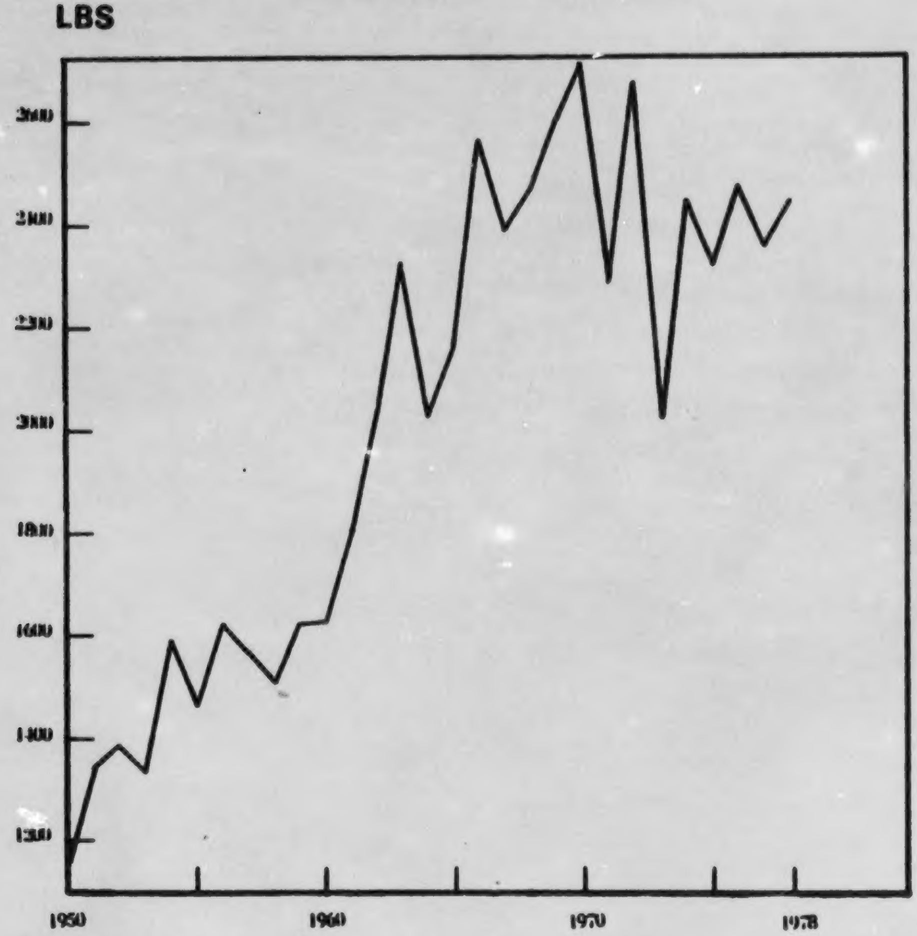
Source: Kentucky Agricultural Statistics, 1978-1979.

TM 1.2.24

KENTUCKY TOBACCO

BURLEY TOBACCO YIELD

1950-1978



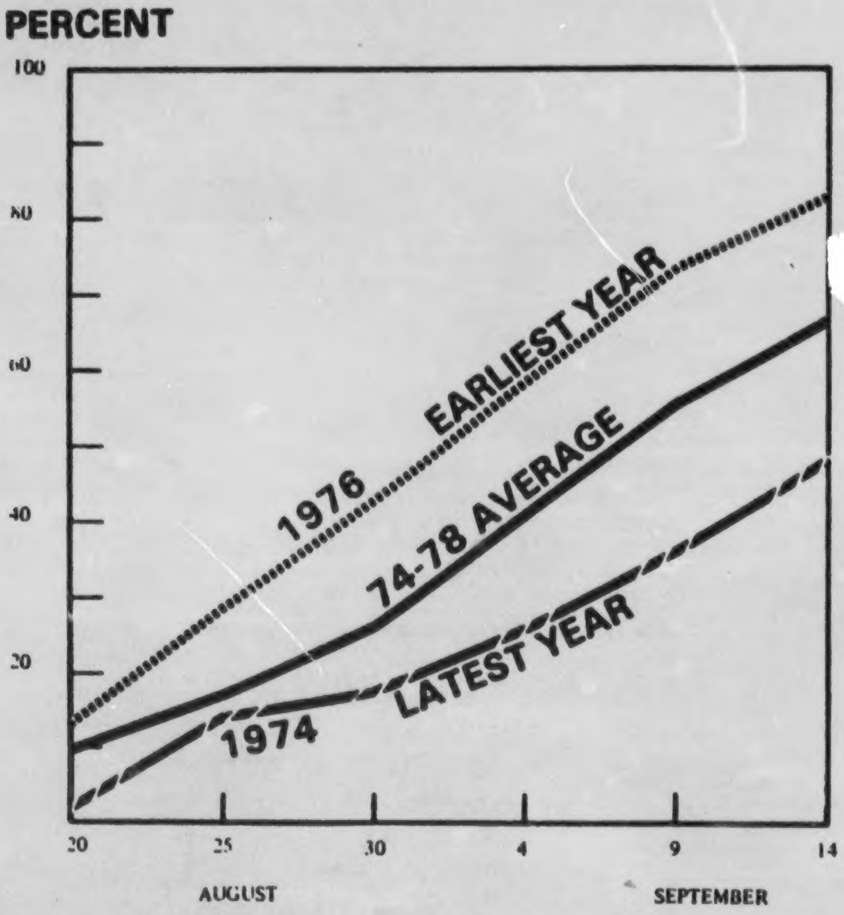
Source: Kentucky Agricultural Statistics, 1978-1979.

TM 1.2.2j

KENTUCKY TOBACCO

% OF BURLEY CUT

74-78 AVERAGE



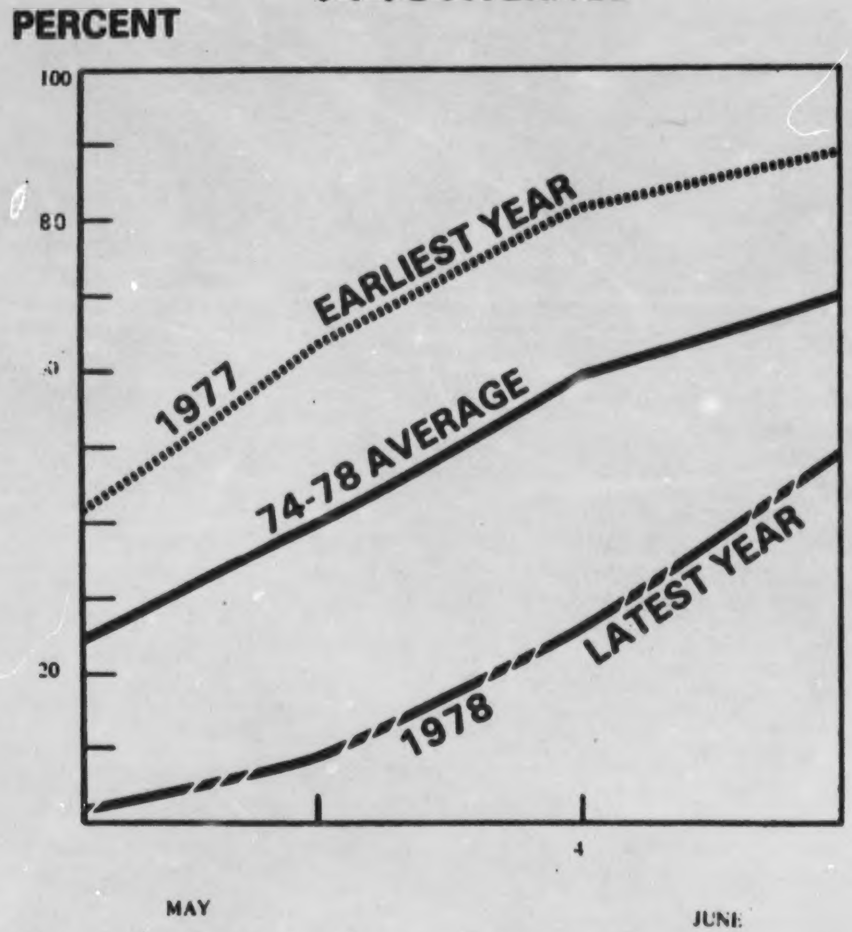
TM 1.2.21

Source: Kentucky Agricultural Statistics: 1978-1979.

KENTUCKY TOBACCO

% OF BURLEY SET

74-78 AVERAGE



TM 1.2.2k

Source: Kentucky Agricultural Statistics: 1978-1979.

2. SELECTING LAND FOR TOBACCO

2.1 Performance Objective

Given a soil survey report and land classification map of a sample farm, the student will select the land best suited for a tobacco plantbed and tobacco field. The land selected will meet standards recommended by the Extension Service.

2.2 Teaching-Learning Activities

a. This section on selecting land for tobacco can best be taught using the problem-solving procedure. Prepare appropriate problems for class use.

b. Take a field trip to observe land for tobacco.

c. Look at slides showing land for tobacco.

d. Use SCS or extension personnel as resource persons.

e. Obtain soils maps for use in class.

f. Make transparencies and/or handouts for use in class using the transparency masters at end of this section.

2.2.1 Selecting land for the plantbed.

The production of healthy, vigorous tobacco plants in the plantbed is directly related to the soil selected.

Tobacco is a high-value crop; therefore, it is essential that the plants be started in a seedbed with the proper soil to produce the desired plants. The texture, tilth, and moisture-holding power of the plantbed soil are of extreme importance in raising tobacco seedlings. Tobacco seed will not germinate unless the soil surface is moist at all times. If the surface of the soil bakes when it dries, the young seedlings will perish. The type of soil as well as the amount of organic matter in the soil will determine the extent to which the soil is favorable for a plantbed.

2.2.2 Selecting land for the tobacco field. (See transparency masters 2.2.2a and 2.2.2b.)

a. Tobacco is a high-value crop using a small percentage of the farm acreage in most instances. Therefore, in setting up a cropping system, a tobacco producer should generally use land most favorable for tobacco. Often even the best land on the farm is not fertile enough to produce the desired yield and quality of tobacco.

b. The topsoil and subsoil both are very important in good tobacco production. Building up the fertility of the soil to produce large yields of high quality tobacco usually takes time. It can be done, however, on land of good physical character, if proper soil-management practices are followed.

2.3 Supplementary Materials

References: 1. A Productive Tobacco Soil, Cir. No. 575-A.

2. Burley Tobacco - Transplanting to Harvest, Publication 293.

3. Tobacco Plantbed Management, AGR-38.

Transparency Masters: 1. 2.2.2a, "Land Classification Map."

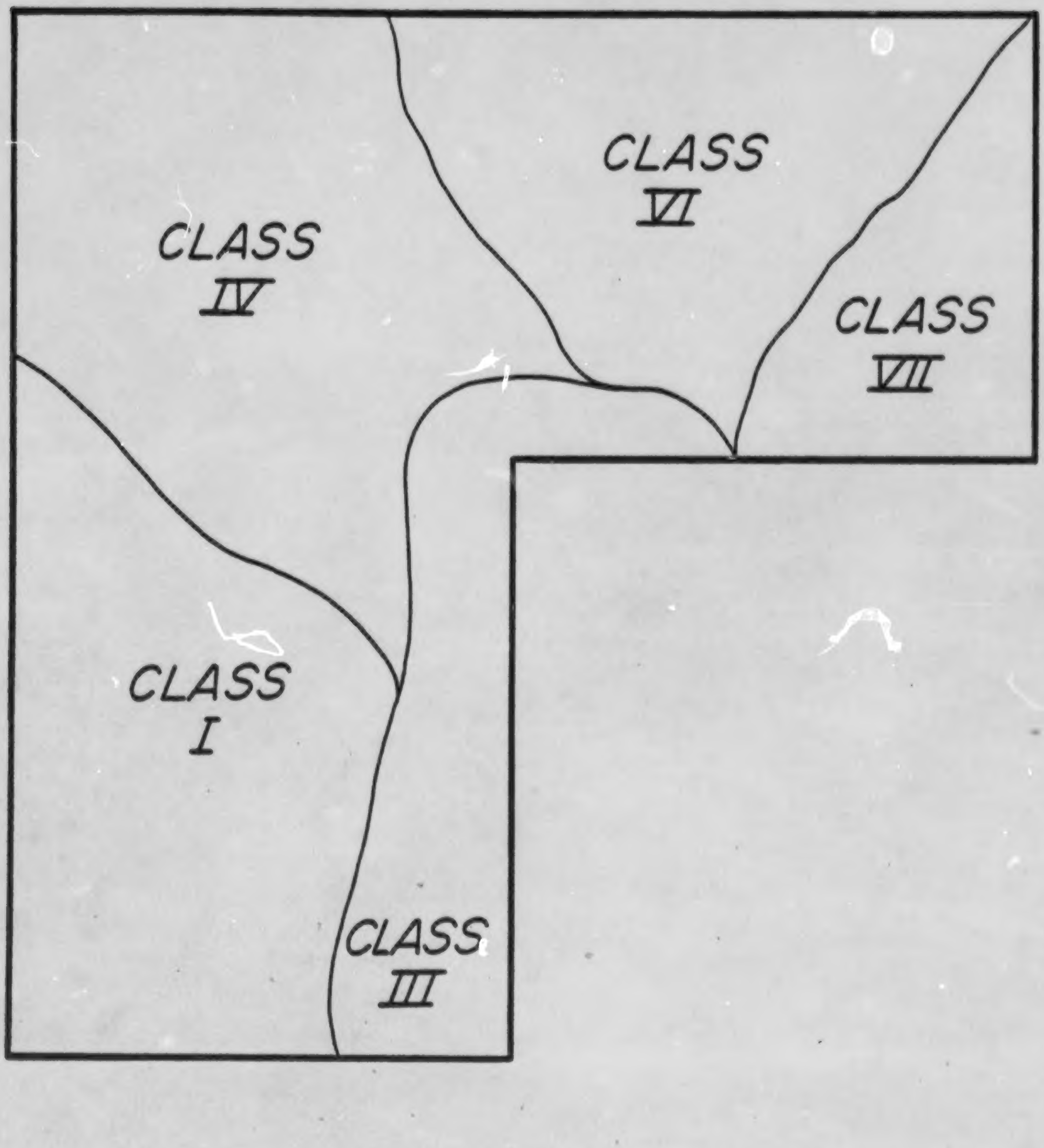
2. 2.2.2b, "Soils Map."

2.4 Check-Out Activities

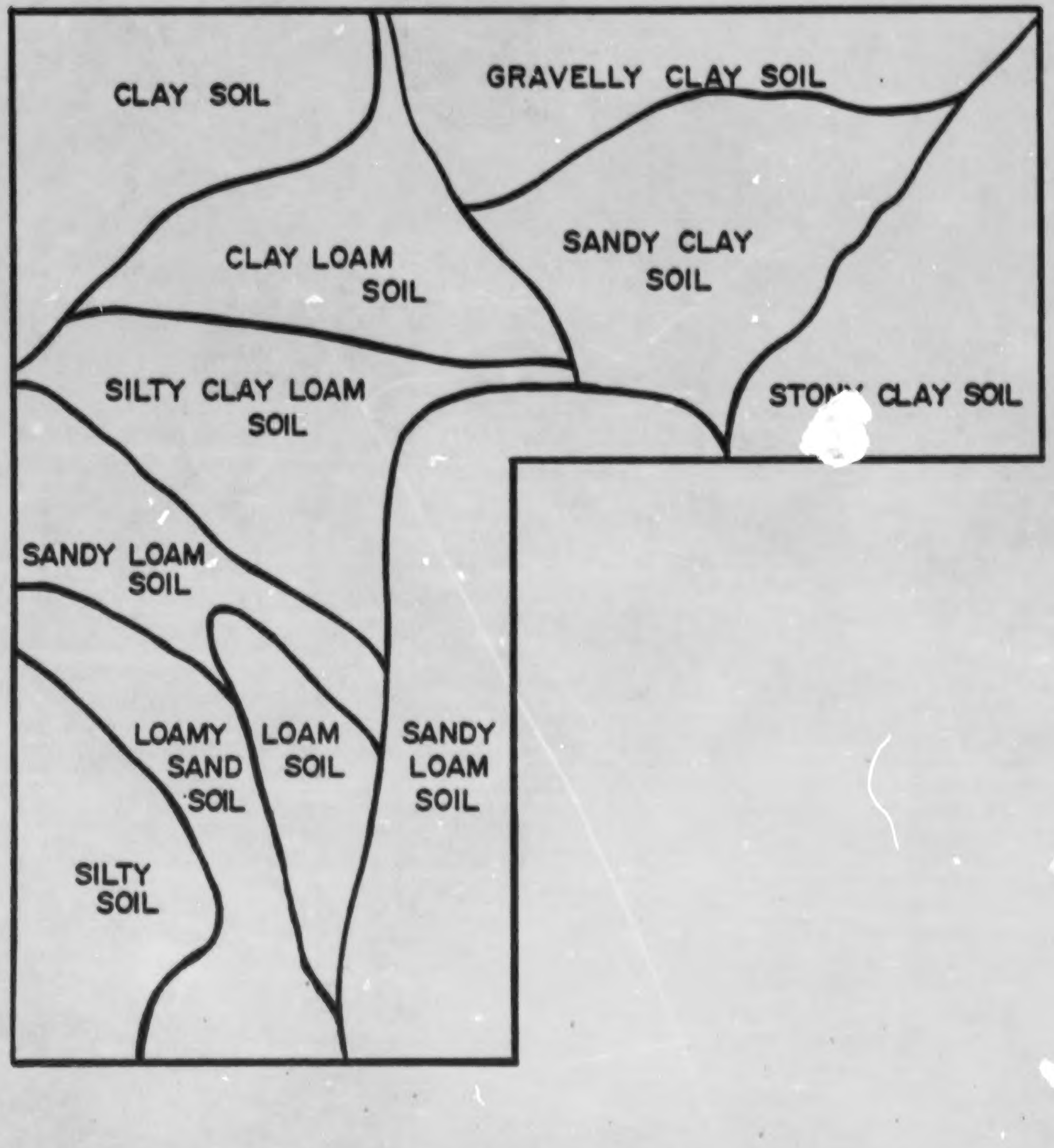
Have students individually select the land best suited for the tobacco plantbed and tobacco field from a soil survey map and land classification map of an example of a farm. (See transparency masters 2.2.2a and 2.2.2b.)

Compare selections to Extension Service recommendations.

LAND CLASSIFICATION MAP


CLASS IV
CLASS VI
CLASS VII
CLASS I
CLASS III

SOILS MAP


CLAY SOIL
GRAVELLY CLAY SOIL
CLAY LOAM SOIL
SANDY CLAY SOIL
SILTY CLAY LOAM SOIL
STONY CLAY SOIL
SANDY LOAM SOIL
LOAMY SAND SOIL
LOAM SOIL
SANDY LOAM SOIL
SILTY SOIL

3. SELECTING THE PLANTBED SITE

3.1 Performance Objective

Given a written check-out activity concerning selecting the plantbed site, students will complete the activity with 80 percent accuracy.

3.2 Teaching-Learning Activities

a. This section on selecting the plantbed site can best be taught using the problem-solving procedure. Prepare appropriate problems for class use.

b. Take a field trip to observe plantbeds or plantbed sites.

c. Look at slides of land for tobacco plantbeds.

d. Use extension personnel, a farmer or other person as a resource person.

e. Use soils maps obtained for lesson number 2.

f. Make a transparency and/or a handout for use in class using the transparency master at the end of this section.

3.2.1 Importance of having good tobacco plants.

Successful production of tobacco seedlings of a desired type is one of the most vital features of commercial tobacco production. It is also one of the most difficult. Serious shortages of tobacco plants occur in many tobacco producing localities each year. Weather and diseases are a chief reason for plant shortages. Properly constructed plantbeds make it possible to control many of the hazards.

3.2.2 Selecting the plantbed site. (See transparency master 3.2.2a.)

a. An adequate supply of healthy, stocky plants should be ready for early transplanting if high-quality tobacco is to be produced. Enough plantbed area should be prepared to provide, at two pullings, the plants needed for the entire crop.

b. Select fertile, well-drained soil high in organic matter, preferably with a slight southern or eastern slope, and free from shade, especially in the forenoon. An ideal place for growing plants is in an open field and near a supply of water. Avoid sites near tobacco barns or other sources of tobacco trash and areas infested with bullnettles, groundcherries, or plantains. These weeds may be a source of tobacco viruses. A bed 100' x 9' or 75' x 12' should supply enough plants for each acre of burley tobacco to be set. For dark tobacco, prepare a bed 50' x 9', or the equivalent, for each acre to be grown.

3.3 Supplementary Materials

Reference: Tobacco Plantbed Management, AGR-38.

Transparency Master: 3.2.2a, "Factors to Consider When Selecting a Plantbed Site."

3.4 Check-Out Activities

Provide the students with the following exercise:

1. The quality of plants in the plantbed is not important since the plants can grow out of most problems. T F
2. Enough plantbed area should be prepared to provide, at _______ pullings, the plants needed for the entire crop.
3. A plantbed _______ feet long and _______ feet wide, or _______ feet long and _______ feet wide, should supply enough plants to set an acre of burley tobacco.
4. Fertile, well-drained soil which is high in organic matter should produce healthy, vigorous tobacco plants. T F
5. The plantbed site should be located on a slight _______ or _______ slope.

ANSWERS:

1. False
2. Two
3. 100 feet long and 9 feet wide or 75 feet long and 12 feet wide
4. True
5. Southern or eastern

49

FACTORS TO CONSIDER WHEN SELECTION A PLANTBED SITE

1. SELECT FERTILE SOIL.
2. SELECT A WELL-DRAINED AREA.
3. SELECT SOIL THAT IS HIGH IN ORGANIC MATTER.
4. SELECT A SITE WITH A SLIGHT SOUTHERN OR EASTERN SLOPE.
5. SELECT A SITE FREE FROM SHADE.
6. AVOID SITES NEAR TOBACCO BARNS OR OTHER SOURCES OF TOBACCO TRASH.

4. TAKING A SOIL SAMPLE AND SENDING IT FOR ANALYSIS

4.1 Performance Objective

a. Given a written check-out activity, students will complete the activity with 80 percent accuracy.

b. Given a plot of land for tobacco production, the necessary soil sampling equipment, and the necessary soil analyzing materials, the student will take a soil sample and analyze the soil for tobacco production. The soil will be collected from the proper areas of the tobacco field and will be analyzed for the necessary plant nutrients needed for tobacco. The analysis will either be provided by the state soils laboratory or conducted individually using a soils testing kit. The resulting recommendations will agree with those of the instructor.

4.2 Teaching-Learning Activities

a. This section on taking a soil sample can best be taught by using the problem-solving procedure. Prepare appropriate lessons for class use.

b. Have students observe a soil-testing demonstration.

c. Provide students the opportunity to practice soil-testing procedures.

d. Have students actually take a soil sample and have it tested.

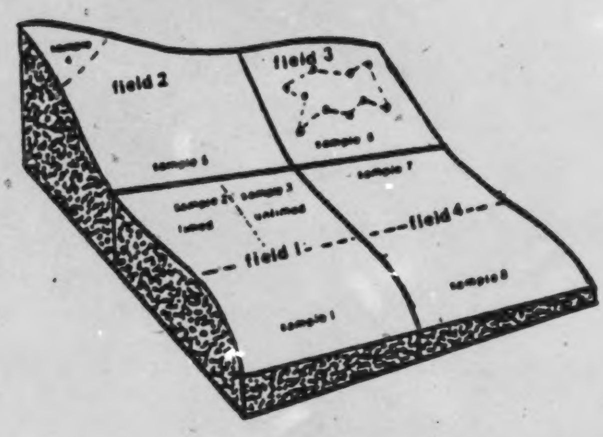
4.2.1 Introduction

a. Most successful tobacco producers use a soil test each year to determine the amount of essential nutrients available in the soil for tobacco production. This tool for soil management provides farmers with the necessary information to successfully conduct a fertilizing and liming program.

b. Soil testing costs only a few cents per acre. It is a wise investment since it prevents farmers from using too little or too much fertilizer and lime, thus saving them several dollars per acre.

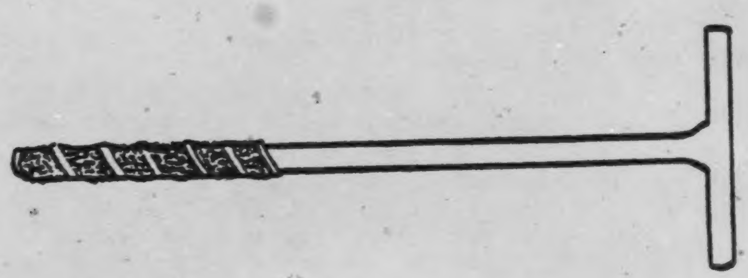
4.2.2 Procedure for taking soil samples.

a. Survey the land to be sampled, grouping similar areas of soil together into plots (hilly areas, bottomland, etc.). (See transparency master 4.2.2a.)

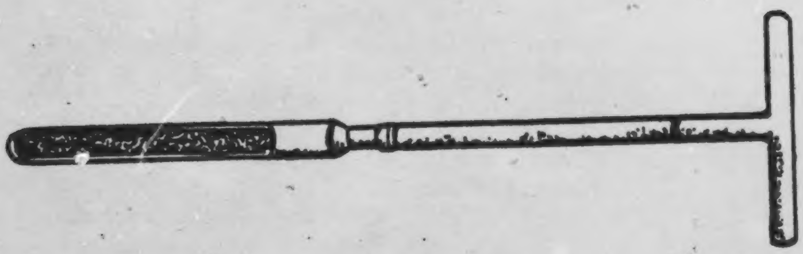

sample 4
field 2
field 3
sample 6
sample 5
sample 7
sample 2
sample 3
tilled
untilled
field 1
field 4
sample 8
sample 1

b. Obtain soil samples using one of the following tools: a soil auger, soil tube, or spade. Insert the tool 6"-8" into the soil since it is in this area that most of the root growth and activity takes place.

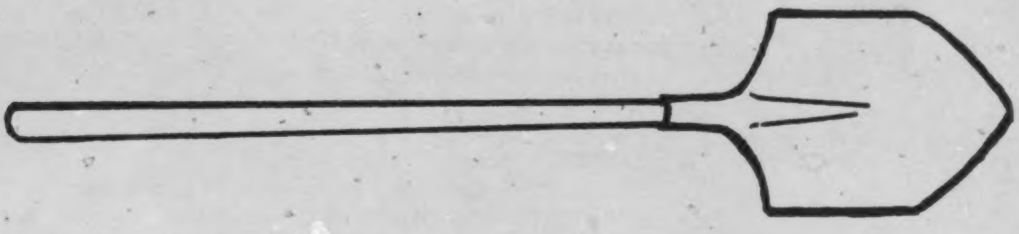
(1) Soil Auger - The soil auger is a sampling device with a screw-type thread that is held upright and twisted or "screwed" into the ground. As it is removed, soil adheres to the threads. (See transparency master 4.2.2b.)



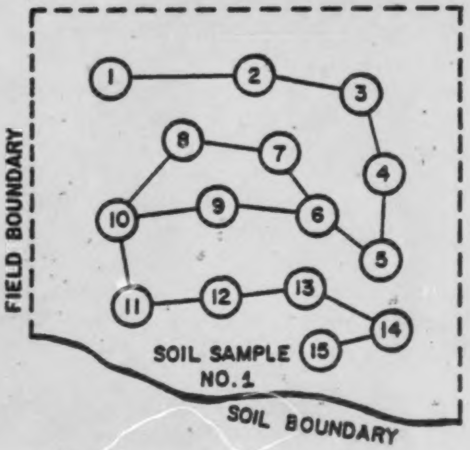
(2) Soil Tube - The soil tube is similar to the auger. Instead of the screw, however, it has a hollow tube. Insert the tube into the soil, remove the tube, and push the soil out of the tube. (See transparency master 4.2.2b.)



(3) Spade - Using a flat-bladed spade, remove a section of soil sufficient to cover the entire spade. With a knife, cut a one-inch wide section in the middle of the soil. This is used as the sample. (See transparency master 4.2.2b.)



c. Move randomly about the area to be sampled, taking 8-15 individual samples in each plot. Avoid areas that will not give you an "average" picture of the soil. Such places might be near a fence row, edges of a highway or access roads, or close to manure droppings. (See transparency master 4.2.2c.)


FIELD BOUNDARY
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
SOIL SAMPLE
NO. 1
SOIL BOUNDARY

d. After removing the samples from the sampling device, place them into a clean container such as a bucket, sack or box. Remove rocks, sticks or other debris. Be sure to keep plot samples separate. Then allow samples to air dry.

e. Mix the composite samples thoroughly. This gives you a representative sample of the entire plot you have sampled. Put 1/2-1 pint of soil into the proper container, such as a soil sample box. (See transparency master 4.2.3c.)

4.2.3 Sending the sample for analysis.

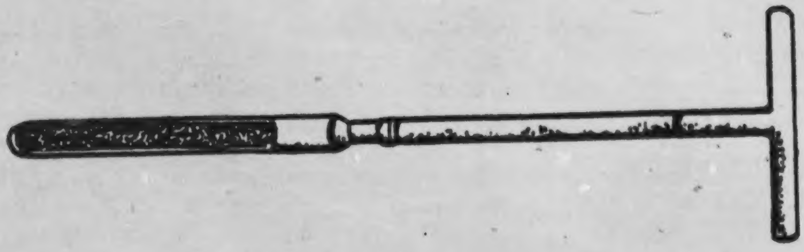
a. After obtaining the necessary soil samples, the next step is to send the sample to a laboratory for analysis. To do this, you will need an analysis sheet (soil test report form) and a container for the sample. NOTE: In some cases the samples are given to the county extension agent for mailing to the laboratory.

b. Providing the information for the analysis sheet is very straightforward. You must simply fill out all necessary information. (See transparency masters 4.2.3a and 4.2.3b.) Information required on most forms is as follows:

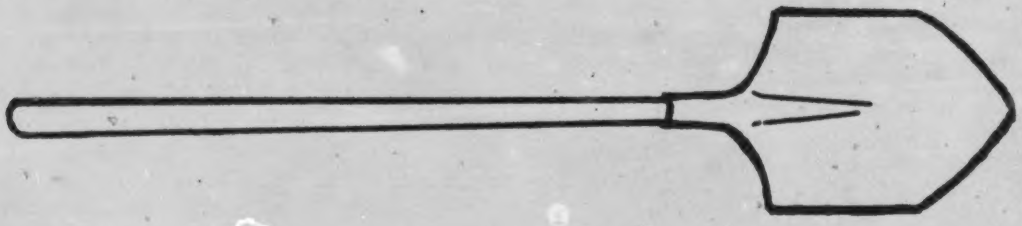
(1) DATE - Month, day and year.
(2) COUNTY - The county from which the sample was taken.
(3) SOIL TYPE - This can be found on a soil map of the area you are sampling. Soil maps are available from the Soil Conservation Service.
(4) DRAINAGE - How well the water drains from the soil.
(5) PAST FERTILIZATION HISTORY - How much nitrogen, potassium and phosphorus has been applied to the sampled area in the past twelve months.
(6) PREVIOUS CROP - The crop that was last grown in the field, along with the yield.
(7) LIME APPLIED - The amount of lime applied in the last three years.
(8) MANURE APPLIED - The amount of manure applied in the last six months.
(9) ACRES IN FIELD - The total amount of acreage in the sampled area.
(10) NUMBER OF BORINGS - The number of samples taken in the area.
(11) CROP PLANNED - The crop that will be in the field should be listed as tobacco.
(12) TYPE OF TEST TO BE MADE - This is usually listed on the back of the analysis sheet. Check the one you desire.
(13) NAME, ADDRESS - Your name and mailing address.

c. After completing the soil analysis sheet, you are ready to complete the information on the sample box. (See transparency masters 4.2.3b and 4.2.3c.)

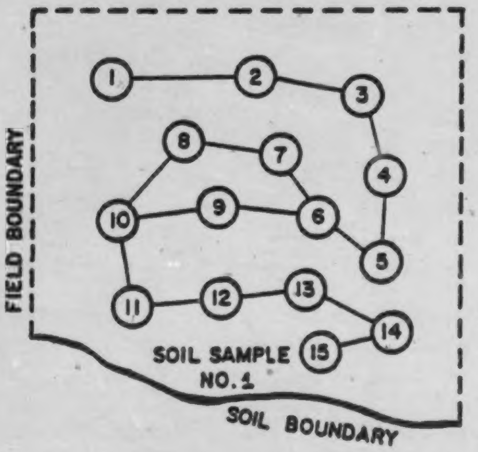
(1) NAME, ADDRESS - Again, complete your name and mailing address.
(2) FIELD NAME OR NUMBER - Fill in the corresponding number from the area sampled to the sample box.



(3) Spade - Using a flat-bladed spade, remove a section of soil sufficient to cover the entire spade. With a knife, cut a one-inch wide section in the middle of the soil. This is used as the sample. (See transparency master 4.2.2b.)



c. Move randomly about the area to be sampled, taking 8-15 individual samples in each plot. Avoid areas that will not give you an "average" picture of the soil. Such places might be near a fence row, edges of a highway or access roads, or close to manure droppings. (See transparency master 4.2.2c.)


FIELD BOUNDARY
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
SOIL SAMPLE NO.1
SOIL BOUNDARY

d. After removing the samples from the sampling device, place them into a clean container such as a bucket, sack or box. Remove rocks, sticks or other debris. Be sure to keep plot samples separate. Then allow samples to air dry.

e. Mix the composite samples thoroughly. This gives you a representative sample of the entire plot you have sampled. Put 1/2-1 pint of soil into the proper container, such as a soil sample box. (See transparency master 4.2.3c.)

4.2.3 Sending the sample for analysis.

a. After obtaining the necessary soil samples, the next step is to send the sample to a laboratory for analysis. To do this, you will need an analysis sheet (soil test report form) and a container for the sample. NOTE: In some cases the samples are given to the county extension agent for mailing to the laboratory.

b. Providing the information for the analysis sheet is very straightforward. You must simply fill out all necessary information. (See transparency masters 4.2.3a and 4.2.3b.) Information required on most forms is as follows:

(1) DATE - Month, day and year.
(2) COUNTY - The county from which the sample was taken.
(3) SOIL TYPE - This can be found on a soil map of the area you are sampling. Soil maps are available from the Soil Conservation Service.
(4) DRAINAGE - How well the water drains from the soil.
(5) PAST FERTILIZATION HISTORY - How much nitrogen, potassium and phosphorus has been applied to the sampled area in the past twelve months.
(6) PREVIOUS CROP - The crop that was last grown in the field, along with the yield.
(7) LIME APPLIED - The amount of lime applied in the last three years.
(8) MANURE APPLIED - The amount of manure applied in the last six months.
(9) ACRES IN FIELD - The total amount of acreage in the sampled area.
(10) NUMBER OF BORINGS - The number of samples taken in the area.
(11) CROP PLANNED - The crop that will be in the field should be listed as tobacco.
(12) TYPE OF TEST TO BE MADE - This is usually listed on the back of the analysis sheet. Check the one you desire.
(13) NAME, ADDRESS - Your name and mailing address.

c. After completing the soil analysis sheet, you are ready to complete the information on the sample box. (See transparency masters 4.2.3b and 4.2.3c.)

(1) NAME, ADDRESS - Again, complete your name and mailing address.
(2) FIELD NAME OR NUMBER - Fill in the corresponding number from the area sampled to the sample box.

d. At this point, you are ready to put your air-dried, 1/2-1 pint sample of soil into the container to send to the laboratory for testing. The address of the laboratory will usually be found on the soil analysis sheets.

NOTE: When the soil analysis is returned, you should apply the kind and amounts of fertilizer specified on the soil test report. These recommendations are made by the soil test laboratory and your local county extension agent.

4.3 Supplementary Materials

References:
1. Gardening-Groundskeeping, GG1.
2. How to Take Good Soil Test Samples, AGR-16.
3. Nursery Production, NP-1.

Slides: "Taking Soil Samples."

Transparency Masters:
1. 4.2.2a, "Grouping Similar Areas of Soil."
2. 4.2.2b, "Soil Sampling Tools."
3. 4.2.2c, "Random Sampling Pattern."
4. 4.2.3a, "Information From Farmer: Soil Test Report."
5. 4.2.3b, "Completed Information From Farmer: Soil Test Report."
6. 4.2.3c, "Sample Box."
7. 4.2.3d, "Completed Sample Box."

4.4 Check-Out Activities

a. Provide students with the following exercise:

1. Why should tobacco producers use the soil testing program?
2. What devices may be used to obtain soil samples?
3. How deep should the sample be taken? Why?
4. What is meant by "random sampling?"
5. How many individual samples are sufficient?
6. How much of the collected soil is actually needed for the soil sample?
7. When should soil samples be taken on tobacco soils?

ANSWERS:

1. Used to determine the amount of fertilizer to add to the soil.
2. Soil tube, soil auger, spade.
3. 6"-8" deep. This area has most of the root growth.
4. Moving about a given area with no set pattern; trying to get a sampling that shows generally what the make-up of the entire plot is.
5. 8-15 individual samples.
6. 1/2-1 pint.
7. Sample in late fall (September to December) or early spring.

b. Have the students collect a soil sample and actually have it tested. To be sure the student chooses a proper sample, you will need to take a sample and have it tested as the control sample.

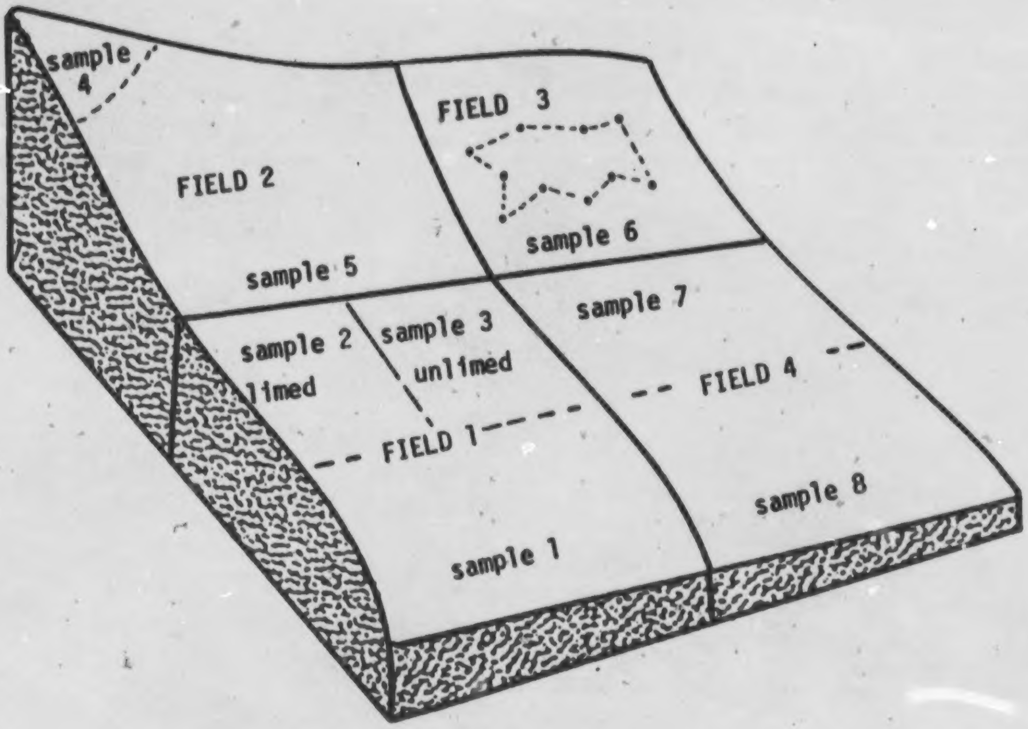
ANSWERS:

Check the student's performance on the procedure for taking soil samples. Place an X in the appropriate box indicating not accomplished, partially accomplished, or fully accomplished. If, because of special circumstances, the item was impossible to complete, place an X in the "Not Applicable" box.

Performance Level: All items must receive a rating of FULLY ACCOMPLISHED (or Not Applicable). If any items are rated NOT ACCOMPLISHED, or Partially Accomplished, the student and instructor will discuss this and decide what remedial work needs to be done.

	Student Performance			
	Not Applicable	Not Accomplished	Partially Accomplished	Fully Accomplished
1. In the process of taking a soil sample, the student:				
a. Used soil tube, auger, or spade properly	( )	( )	( )	( )
b. Obtained 8 to 15 individual samples in depths from 6'8".	( )	( )	( )	( )
c. Allowed to air dry	( )	( )	( )	( )
d. Obtained sufficient amount for sample	( )	( )	( )	( )
e. Mixed sample thoroughly . .	( )	( )	( )	( )
2. In the process of sending soil samples for analysis, the student:				
a. Filled out report form with all necessary information .	( )	( )	( )	( )
b. Filled out sample box with all necessary information .	( )	( )	( )	( )

GROUPING SIMILAR AREAS OF SOIL


sample 4
FIELD 3
FIELD 2
sample 6
sample 5
sample 7
sample 2 limed
sample 3 unlimed
FIELD 4
FIELD 1
sample 8
sample 1

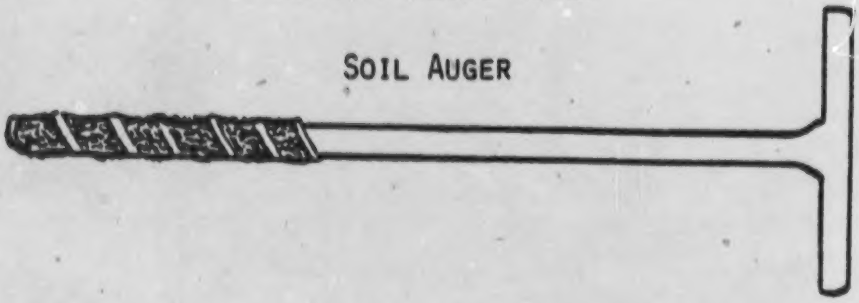
Source: Gardening-Groundskeeping.

TM 4.2.2a

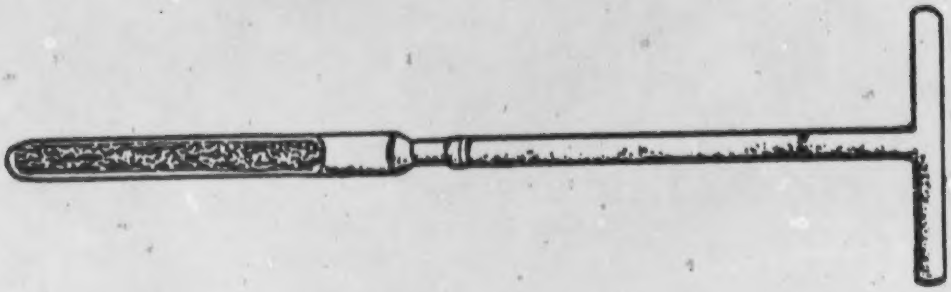
TM 4.2.2b

SOIL SAMPLING TOOLS

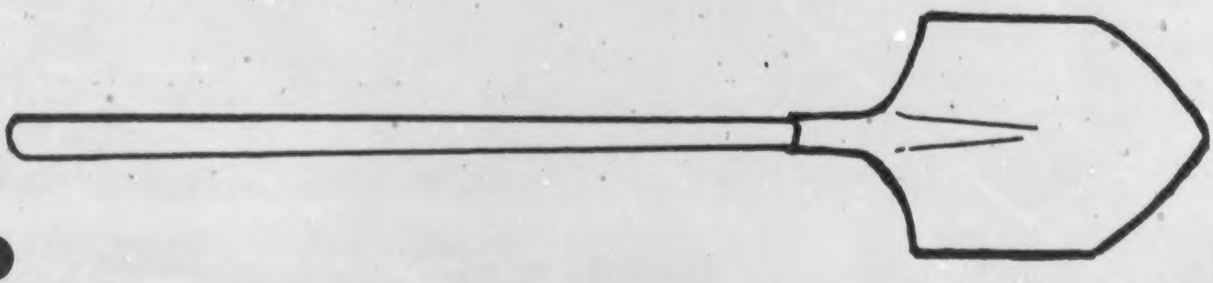
SOIL AUGER



SOIL TUBE

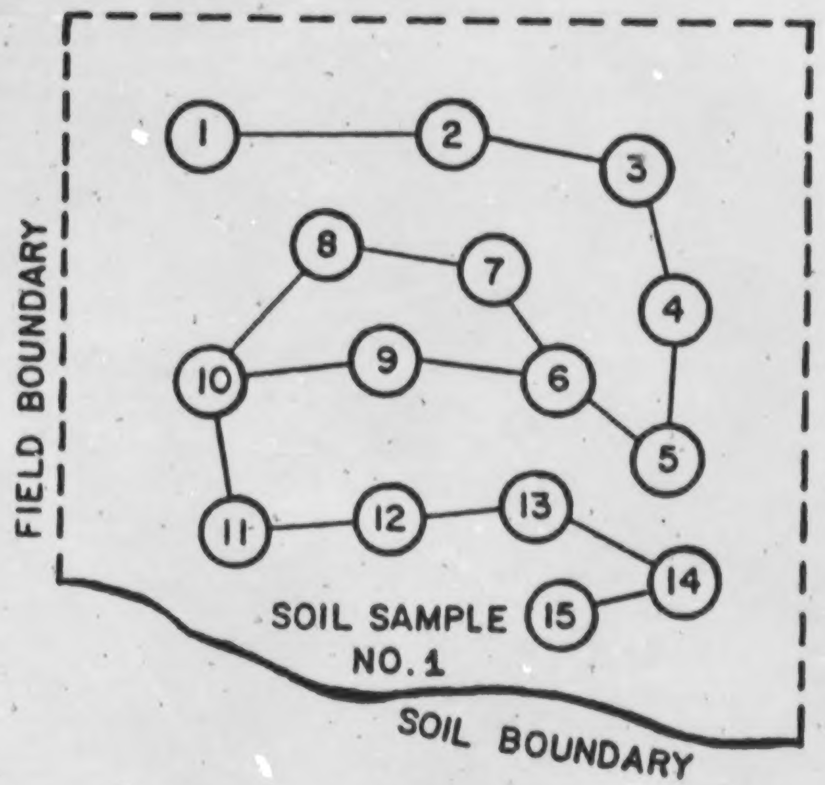


SPADE



Source: Gardening-Groundskeeping.

RANDOM SAMPLING PATTERN

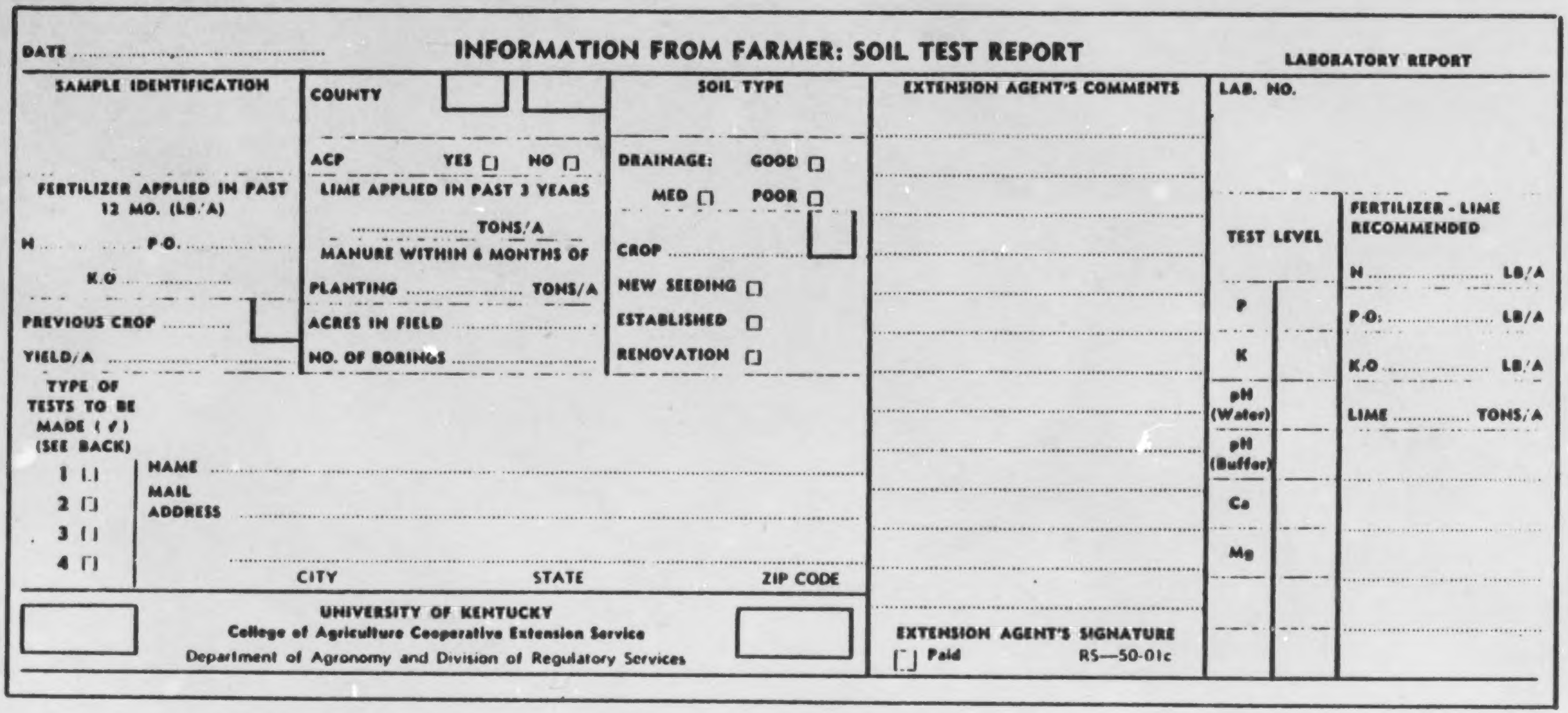

FIELD BOUNDARY
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
SOIL SAMPLE
NO. 1
SOIL BOUNDARY

Source: Gardening-Groundskeeping.

TM 4.2.2c

INFORMATION FROM FARMERS:

SOIL TEST REPORT



DATE ....

INFORMATION FROM FARMER: SOIL TEST REPORT

LABORATORY REPORT

SAMPLE IDENTIFICATION

FERTILIZER APPLIED IN PAST 12 MO. (LB./A)

N .... P.O. ....

K.O ....

PREVIOUS CROP ....

YIELD/A ....

TYPE OF TESTS TO BE MADE (✓) (SEE BACK)

1 ☐
2 ☐
3 ☐
4 ☐

COUNTY

ACP YES ☐ NO ☐

LIME APPLIED IN PAST 3 YEARS

.... TONS/A

MANURE WITHIN 6 MONTHS OF PLANTING .... TONS/A

ACRES IN FIELD ....

NO. OF BORINGS ....

SOIL TYPE

DRAINAGE: GOOD ☐ MED ☐ POOR ☐

CROP ....

NEW SEEDING ☐

ESTABLISHED ☐

RENOVATION ☐

NAME ....

MAIL ADDRESS ....

CITY STATE ZIP CODE

EXTENSION AGENT'S COMMENTS

EXTENSION AGENT'S SIGNATURE

☐ Paid RS—50-01c

LAB. NO.

TEST LEVEL		
P		
K		
pH (Water)		
pH (Buffer)		
Ca		
Mg		

FERTILIZER - LIME RECOMMENDED

N .... LB/A

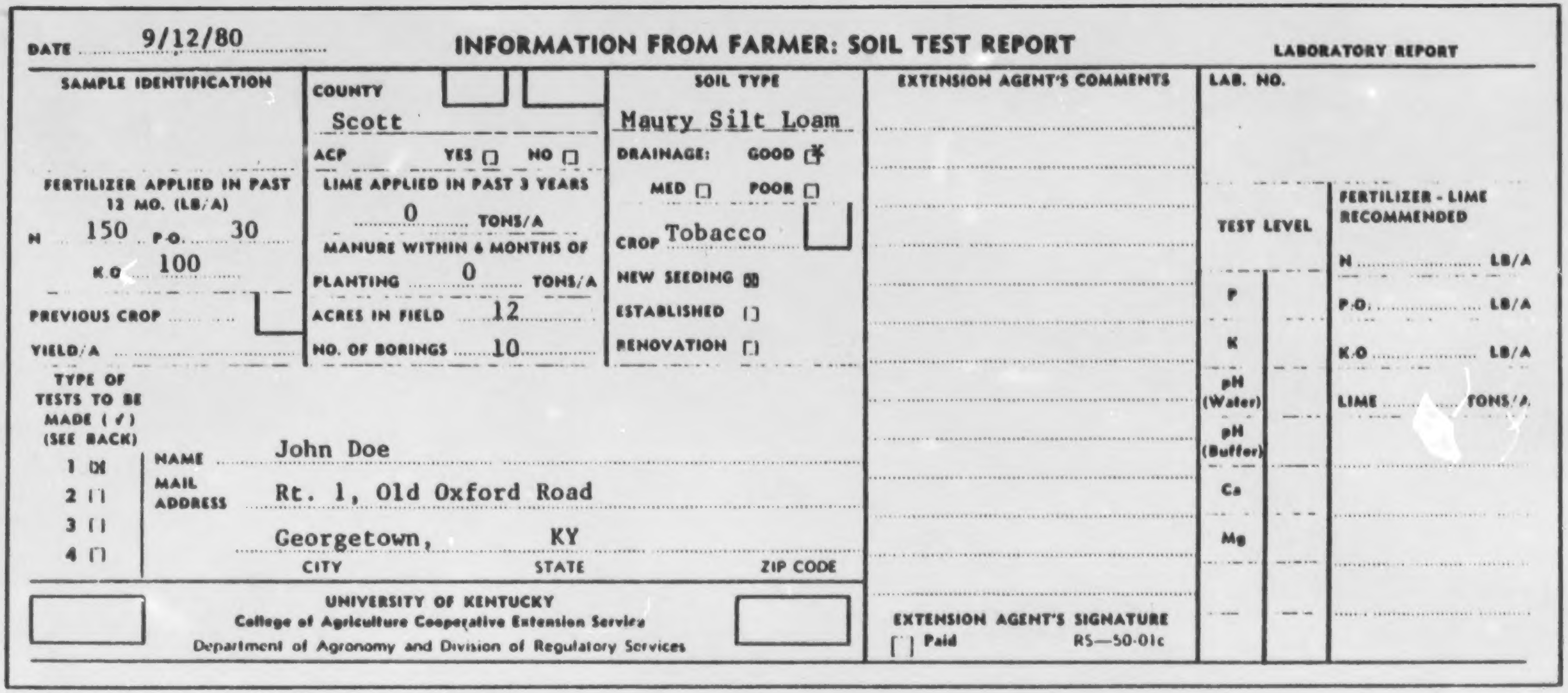
P.O. .... LB/A

K.O .... LB/A

LIME .... TONS/A

UNIVERSITY OF KENTUCKY
College of Agriculture Cooperative Extension Service
Department of Agronomy and Division of Regulatory Services

COMPLETED INFORMATION FROM FARMER: SOIL TEST REPORT



DATE 9/12/80

INFORMATION FROM FARMER: SOIL TEST REPORT

LABORATORY REPORT

SAMPLE IDENTIFICATION

FERTILIZER APPLIED IN PAST 12 MO. (LB/A)

N 150 P₂O₅ 30

K₂O 100

PREVIOUS CROP

YIELD/A

COUNTY Scott

ACP YES ☐ NO ☐

LIME APPLIED IN PAST 3 YEARS 0 TONS/A

MANURE WITHIN 6 MONTHS OF PLANTING 0 TONS/A

ACRES IN FIELD 12

NO. OF BORINGS 10

SOIL TYPE Maury Silt Loam

DRAINAGE: GOOD ☒ MED ☐ POOR ☐

CROP Tobacco

NEW SEEDING ☒

ESTABLISHED ☐

RENOVATION ☐

EXTENSION AGENT'S COMMENTS

LAB. NO.

TEST LEVEL

P

K

pH (Water)

pH (Buffer)

Ca

Mg

FERTILIZER - LIME RECOMMENDED

N LB/A

P₂O₅ LB/A

K₂O LB/A

LIME TONS/A

TYPE OF TESTS TO BE MADE (✓) (SEE BACK)

1 ☒
2 ☐
3 ☐
4 ☐

NAME John Doe

MAIL ADDRESS Rt. 1, Old Oxford Road

Georgetown, KY

CITY STATE ZIP CODE

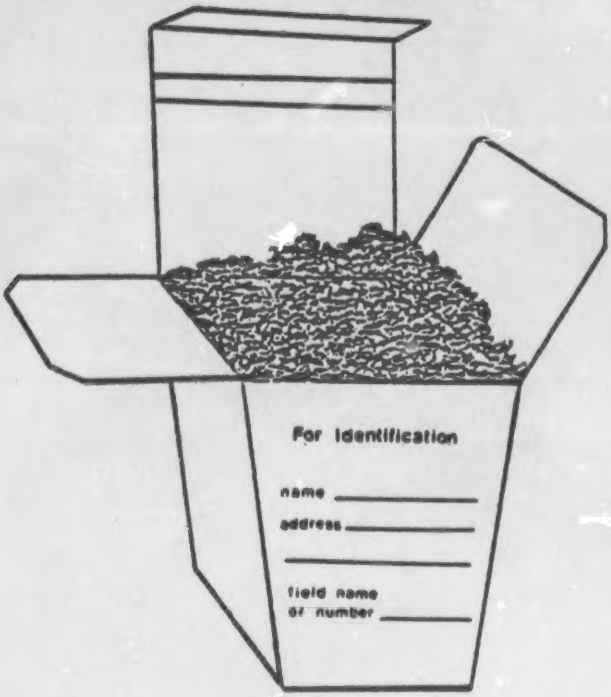
UNIVERSITY OF KENTUCKY
College of Agriculture Cooperative Extension Service
Department of Agronomy and Division of Regulatory Services

EXTENSION AGENT'S SIGNATURE

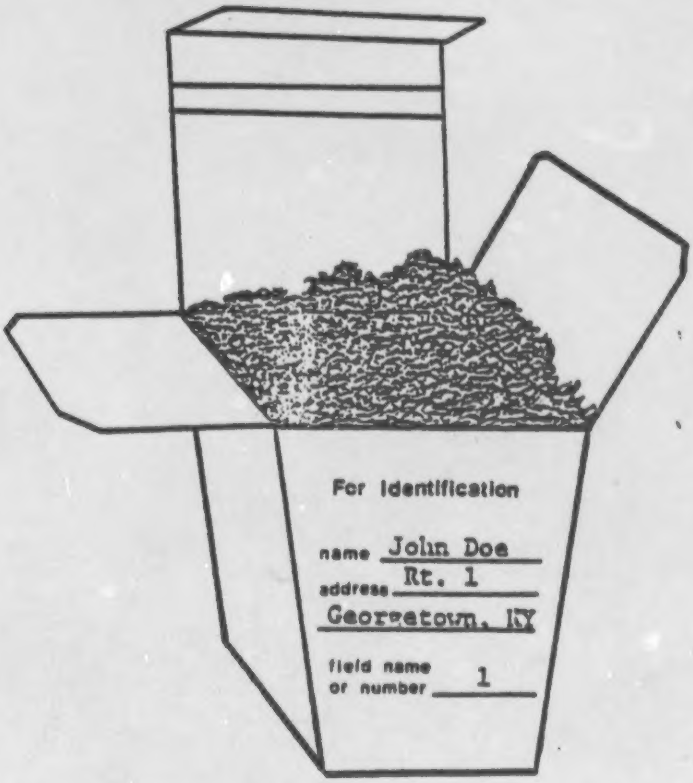
☐ Paid RS—50-01c

EM 4.2.3b

SAMPLE BOX


For Identification
name
address
field name
or number

COMPLETED SAMPLE BOX



For identification

name John Doe
address Rt. 1
Georgetown, KY

field name or number 1

5. CORRECTING THE pH LEVEL OF SOIL

5.1 Performance Objective

a. Given a written check-out activity on correcting the pH level of soil, the student will complete the activity with 80 percent accuracy.

b. Given the soil acidity level and a table of lime requirements, the student will determine levels of lime needed. The amount recommended will agree with the instructor's key.

c. Given the soil acidity level, a table of lime requirements, and lime, the student will lime the soil in preparation for tobacco production. The lime will be spread evenly over the entire field without skips or heavy concentrations.

5.2 Teaching-Learning Activities

a. This section on liming can best be taught using the problem-solving procedure. Prepare appropriate lessons for use in class.

b. Have students observe a demonstration of liming a field.

c. Provide students with opportunities to practice liming procedures.

5.2.1 Determining soil pH and using agricultural limestone to correct for soil acidity.

a. Control of soil acidity by liming is very important in successful tobacco culture. Soil acidity affects the availability to plants of nearly all nutrient elements in the soil. As soils become more acid, certain elements such as aluminum and manganese become more available and may be toxic to plants, while phosphorus and molybdenum become less available.

b. Soil acidity also affects the availability of added fertilizers and the efficiency of fertilizer use. The addition of fertilizers, particularly nitrogen fertilizer, makes the soil more acid. Generally, a desirable soil pH for tobacco is 6.4 prior to fertilization. This is because soil pH drops near the middle of the growing season by 0.5 to 1.0 pH unit due to application of fertilizer. These facts should be considered in any liming program for tobacco. When soil tests are available, the lime requirement test (buffer pH) provides the best information on lime needs.

c. Limestone (the most common liming material in Kentucky) will correct soil acidity more effectively if applied and thoroughly mixed with the soil one to three years ahead of the crop. Summer and fall are good times to apply lime since the soil is dry, dealers in agricultural lime are not as busy at these times of the year, and the lime applied at these times reacts overwinter. Greater effort should be given to insure proper mixing with soil when applications of lime are made near the time of transplanting the tobacco crop. If applications are made two or more years ahead of the crop, the entire application may be applied to the soil surface. When liming needs are not determined until the fall or early spring before transplanting on strongly acid soil (water pH 5.5 or below) half the lime should be plowed down and the other half disced in after plowing. Since soil acidity must be corrected in a relatively short period of time under these conditions, the quality of the liming material, particularly its fineness, is of great importance.

d. It is essential to lime acid soils, but excessive liming should be avoided. When soils become neutral, or basic (pH 7.0 and higher), phosphorus will revert to insoluble forms and some minor elements will be less available for plant growth.

This section is taken from Fertilizing Burley Tobacco.

5.3 Supplementary Materials

References:
1. Fertilizing Burley Tobacco, AGR-49.
2. Manganese Toxicity in Burley Tobacco, AGR-22.
3. When to Apply Lime and Fertilizer, AGR-5.
4. 1979 Lime and Fertilizer Recommendations, AGR-1.

Transparency Master: 5.2.1a, "Relationship of Plant Nutrient Availability to Soil pH."

5.4 Check-Out Activities

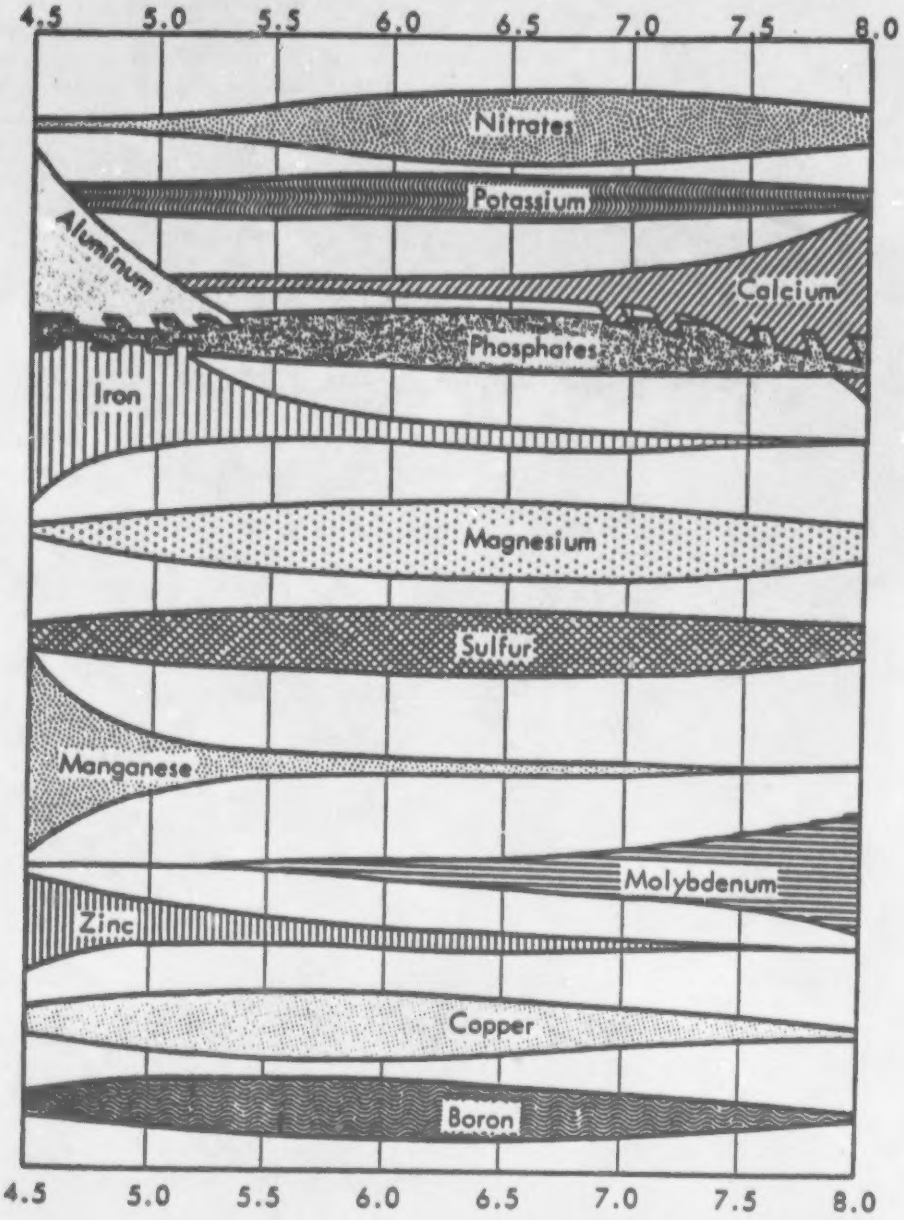
a. Provide students with the following exercise:

1. What is the most common liming material in Kentucky?
2. What is the affect on the plant if the pH is below 5.5?
3. What is the best pH range for growing tobacco?
4. When should soil be limed for tobacco?
5. You can apply too much lime. T F

ANSWERS:

1. Agricultural limestone
2. May cause aluminum and manganese toxicity
3. 6.0 to 6.5
4. Below 6.5 pH
5. True

RELATIONSHIP OF PLANT NUTRIENT AVAILABLE TO pH



Source: Manganese Toxicity in Burley Tobacco.

b. What rate of lime in tons should be applied at each of the following pH levels?

6.5
5.9
6.2
5.7
5.0
4.8
5.4

Use the following chart to determine lime needed:

Soil-Water pH	Tons Limestone per Acre
Above 6.4	0
6.4 - 5.8	1 - 3 tons
5.8 - 5.2	3 - 5 tons
Beolw 5.2	5 tons

ANSWERS:

6.5 = 0
5.9 = 1-3
6.2 = 1-3
5.7 = 3-5
5.0 = 5
4.8 = 5
5.4 = 3-5

c. Instructor's Final Checklist

Check the student's performance in determining the correct amount of limestone to correct the pH level of the soil. Compare the student's results to the recommendations of the soil testing laboratory at the University of Kentucky.

6. PREPARING AND TREATING THE TOBACCO PLANTBED FOR WEED CONTROL

6.1 Performance Objective

[illegible] Given a written check-out activity concerning preparation and treating the tobacco plantbed for weed control, the students will complete the activity with 80 percent accuracy.

b. Given a plantbed for tobacco production, necessary application equipment, and necessary chemicals, the student will properly apply the treatment to the plantbed.

6.2 Teaching-Learning Activities

a. This section on preparing and treating the tobacco plantbed for weed control can best be taught using the problem-solving procedure. Prepare appropriate lessons for use in class.

b. Obtain materials used in weed control and have them on hand for students to observe.

c. Demonstrate one or more methods of weed control, and have students practice, if possible.

d. Use a chemical salesman as a resource person.

e. Make a transparency from the transparency master at the end of this section.

f. Take field trip(s) to observe weed control methods being applied and/or results obtained.

6.2.1 Preparing the plantbed for weed control.

a. Regardless of the weed control method to be used, plow the ground three or four weeks before treatment, work the ground thoroughly, and leave it level. Many farmers prefer to prepare their soil and treat it for weeds in the fall. Burning in the fall is also preferable to spring preparation.

b. When breaking the soil, begin in the middle of the bed and throw furrows on each side toward the middle until breaking is completed. This will make the bed higher than the surrounding ground and will keep outside water from flowing over the bed.

6.2.2 Killing weed seed in the plantbed. (See transparency master 6.2.2a.)

a. Tobacco plants are so small when they germinate that they cannot stand the competition of weed growth. Weeding tobacco beds is a slow and tedious job and may injure the young tobacco plants.

b. The best way to prevent weeds in the plantbed is to kill w[illegible] seeds in the plantbed before sowing the tobacco seed. Do not attempt to destroy weed seed in plantbeds when the soil is wet regardless of the method used. Neither chemicals nor heat penetrate wet soil very deeply, and this will result in poor weed control. Also, soils burned or steamed when wet may become so hard that the tobacco plants cannot grow.

c. Weed seeds may be killed by burning, gasing or drenching. You can use any of these soil treatments either in the fall or in the spring. Fall treatments often result in slightly poorer weed control than do similar treatments in the spring, but the prevalence of suitable weather, the better working condition of the soil, and higher soil temperatures in the fall are factors which usually more than offset that disadvantage.

6.2.3 Treating the plantbed for weed control by burning.

If beds are to be burned, use enough wood to heat the soil to a depth of 3-4 inches. Usually 30 minutes of burning with fairly large wood will provide enough heat to kill weed seed near the surface. Still, one should be careful. Burning wood for more than two hours, or burning the same site several years continuously, may result in areas in the bed which will grow few or no tobacco plants. Heating soils that are high in manganese may result in high levels of available manganese, causing young tobacco plants to be retarded in growth and, in extreme cases, killed. Burned beds should not be seeded until the soil cools.

6.2.4 Treating the plantbed for weed control by using methyl bromide gas.

When using methyl bromide gas, the soil should be worked thoroughly just before treatment. Cover the bed with a gas-proof cover and seal the edges with soil; insert tube (plastic) at three points in a 100-foot bed, one at each end and one in the center. An evaporating pan or tray should be placed under the cover at the end of each tube. When unheated methyl bromide is used, the soil temperature should be 50 degrees F or warmer. Puncture cans with the applicator in the lower position, and release 9 pounds of methyl bromide gas for a bed 100 x 9 feet, and 12 pounds for a bed 100 x 12 feet into the evaporating pans or trays under the plastic cover. Leave the plastic cover on the bed for at least 24 hours, and do not seed beds for 24 hours after cover has been removed. Enide should be applied to the plantbed when using methyl bromide for the control of clovers.

6.2.5 Treating the plantbed for weed control by using hot methyl bromide gas.

When using hot methyl bromide, treatment may be made when the soil temperature is at 40 degrees F. Have a bucket or other container with 5 gallons or more of hot water at a temperature of 150-160 degrees F (as hot as the hand can stand). Puncture the can with the applicator in the upper position instead of in the lower position as used in the conventional method. Then submerge the can at once in the container of hot water leaving only the punctured area above the water. The methyl bromide is released as a gas instead of a liquid, thus evaporating pans in the bed are not needed. If you use the hot-gas method, time before removing plastic covers may be shortened to 4-6 hours. It requires about 5 minutes for the gas to evaporate from a 1-pound can. In using hot methyl bromide, release two-thirds of the gas through tubes placed at the side of the bed.

Remember, methyl bromide is a poisonous gas, so be sure to follow the precautions on the label carefully.

6.2.6 Treating the plantbed for weed control by drenching.

a. Plowing 4 weeks before drench application is necessary for effective weed control. Advance plowing permits the soil to firm down, thereby forcing out much of the air. Drench materials rapidly change to gases after application, and they destroy weed seed by contact. To be effective, the gases must be concentrated in the soil. This concentration is possible only when soils have lost much of the air which is found in freshly-plowed land.

b. Soil temperature should be 50° F or warmer when you treat the bed. In extremely dry weather, when the ground is dusty, an application of water to the bed area a few days before treatment, followed by a light raking or disking, helps the solution penetrate the soil. Either break up or rake off all clods from the bed site.

c. Use 2 gallons of Vapam in 100-125 gallons of water per 100 square yards of bed. Mix well and sprinkle evenly over the bed area; follow immediately with 100 gallons of water to seal the material in the soil. You may apply the material with a power pump or sprinkling can. Vapam undergoes a chemical reaction in the soil, releasing a toxic gas which kills weed seed.

d. Vapam may also be used by mixing 2 gallons in 10-12 gallons of water. Sprinkle on bed and cover with plastic immediately. This material is highly volatile and will not penetrate the soil unless covered immediately after application.

6.2.7 Treating the plantbed for weed control by chemical injection.

Chemical injection equipment is being used to inject methyl bromide, Vapam, and Vorlex into the soil. This method is being handled primarily by custom operators. It appears to be a very popular way to treat the soil for weed control. The operator of the equipment can inject the chemicals into the soil to the desired depths. Polyethylene film (plastic) cover is used to trap the gases. These covers should be left on the bed for five days or more. They are often left on the bed over winter. This practice prevents the soil from packing or becoming excessively wet and permits you to seed when convenient. However, the soil must be firmed by rolling or tramping to prevent the soil from drying out too rapidly after seeding.

6.2.8 Treating the plantbed for weed control by using enide.

a. In 1971, Enide changed from a 50 percent to 90 percent wettable powder with extremely fine particles to prevent nozzle and screen clogging. It is a selective, pre-emergence weed killer which destroys certain broadleaf weeds and grasses as they germinate in the plantbed. Enide works best when used in combination with one of the treatments described above. It is sprayed onto the soil surface after seeding and is particularly good for control of clovers.

b. Follow directions on container for amount to use. Be sure that you know whether you have 50 percent or 90 percent material. The Enide is mixed with 2-3 gallons of water. More Enide is used on heavy soils.

Stir until all the Enide is in suspension, and agitate the mixture occasionally while spraying. The most practical sprayer is the hand-pressurized sprayer with a three-gallon capacity and a fan-type nozzle. If you don't get 1/2 inch of rain within three days following treatment, you should wash in the Enide with 300 gallons of water per bed.

6.3 Supplementary Materials

References: 1. Tobacco Plantbed Management, AGR-38.

2. UK Ag Report - Special Edition.

Slides: "Applying Soil Fumigants," NP-4.

Transparency Master: 6.2.2a, "Methods of Treating Plantbeds for Weed Control."

6.4 Check-Out Activities

a. Provide the students with the following exercise:

1. When should the plantbed ground be plowed regardless of the weed control method to be used?
2. When breaking soil for a plantbed, why is it important to begin in the middle and throw the furrows on each side?
3. Why is weeding a plantbed harmful to tobacco plants?
4. Will a fall treatment or spring treatment result in the most favorable weed control?
5. Name three methods of treating plantbeds for weed control.

ANSWERS:

1. Three to four weeks before treatment
2. This will make the bed higher than surrounding ground and prevent water from flowing over the bed
3. Injures the plants
4. Spring
5. Burning, methyl bromide gas, hot methyl bromide gas, drenching, chemical injection

b. Have the students apply the correct amount of the recommended chemical to a plantbed according to the latest recommendations of the University of Kentucky Agricultural Experiment Station.

METHODS OF TREATING PLANTBEDS
FOR WEED CONTROL

BURNING

METHYL BROMIDE GAS

HOT METHYL BROMIDE GAS

DRENCHING

CHEMICAL INJECTION

7. SELECTING A VARIETY OF TOBACCO

7.1 Performance Objective

a. Given a written check-out activity concerning selecting a variety of tobacco, student will complete the activity with 80 percent accuracy.

b. Given a tobacco production project or an example situation, such as the school land laboratory, each student will select the best variety of tobacco to grow.

7.2 Teaching-Learning Activities

a. This section on selecting a variety of tobacco can best be taught using the problem-solving procedure. Prepare appropriate lessons for use in class.

b. Take a field trip to the University of Kentucky to visit Agricultural Experiment Station farms and visit with UK staff members.

c. Provide students with copies of Extension Publication AGR-13, Recommended Tobacco Varieties for Kentucky, and Extension Publication AGR-42, Use a Resistant Tobacco Variety. Divide the students into groups or let them work individually. Assign each group or individual a burley tobacco variety. Have each individual or group report to the class the major findings concerning their assigned variety. Advantages, disadvantages, size of plant, disease resistance, etc., should be brought out by the students. This may best be done as part of directed study in problem-solving.

d. Survey the class to determine which variety of tobacco is grown on the students' home farms.

e. Have each student in the class survey three different tobacco producers in the community to determine the most widely used tobacco variety in the area. Discuss the findings in class.

f. Invite a tobacco seed company representative to present information to the class concerning the varieties available from his/her company and their capabilities. (A field trip to a tobacco seed company may be arranged rather than to bring in a speaker.)

g. If a school farm laboratory is available, and tobacco is grown, allow each class member to choose the variety of tobacco to be grown.

h. Make and use a transparency using the transparency master found at the end of this section.

7.2.1 Importance of proper variety selection. (See transparency master 7.2.1a.)

Each year the tobacco producer is faced with the decision of which variety will be the most profitable for him to grow. Selecting a variety simply because it has done well on a neighbor's farm is not the best way to make a choice. However, those varieties which are considered to be doing well in the community should be considered because they are usually better adapted to the area. Careful consideration should be placed on the selection of a tobacco variety. The crop can be no better than the maximum permitted by the genetic potential of the chosen variety. This applies to disease resistance and quality as well as to yield.

7.2.2 Characteristics of recommended standard varieties of tobacco.

a. Ky. 10 will produce a good yield of acceptable tobacco. The leaf does not stand up quite as much as Burley 21 and Ky. 9, but the leaves are wider and closer together on the stalk. It matures about one week later than Burley 21. It has a shorter growth habit than both Burley 21 and Ky. 9. This variety will stand well in the wind. It is comparable to Ky. 9 in resistance to black root rot and mosaic. It has more resistance to fusarium wilt than Ky. 9.

b. The variety Ky. 14 is highly resistant to wildfire, mosaic, and fusarium wilt and has medium-high resistance to black root rot. It is a stand-up variety, uniform in growth. The leaves are a little shorter and wider than those of Burley 21. Plant height is about the same as Burley 21 and the plants hold their bottom leaves well. Ky. 14 matures seven to ten days later than Burley 21 and produces satisfactory yields of good quality leaf.

Burley 21 is a good stand-up variety, resistant to wildfire, black root rot, and mosaic. The plants are early and vigorous, producing a good yield of high quality smoking tobacco.

c. Ky. 15 is a high quality, stand-up burley tobacco variety which yields extremely well. It possesses near immunity to the black root rot disease. It is also resistant to tobacco mosaic virus, wildfire and the fusarium wilt diseases. Ky. 15 is taller than Ky. 10, but the leaf size and number are very similar to those of Ky. 10. Ky. 15 matures 5-6 days earlier than Ky. 10. Ky. 15 was released cooperatively by the Kentucky Agricultural Experiment Station and the U. S. Department of Agriculture in 1977 for production by producers in 1978.

d. Ky. 17 is a stand-up burley tobacco which produces reasonable yields of high quality leaf. This new variety is distinguished by possessing good field level resistance to both races of black shank. In addition, Ky. 17 is resistant to tobacco mosaic virus, wildfire, black root rot and fusarium wilt. Ky. 17 is taller than Ky. 10 and has a leaf number and size similar to Ky. 10. Ky. 17 matures 3-4 days earlier than Ky. 10. Leaf yields produced by Ky. 17 averaged 400-500 pounds per acre more than Burley 49 in replicated tests.

e. Burley 37 is a stand-up variety resistant to black shank and wildfire but with low resistance to black root rot and fusarium wilt. Yield and quality are better than Burley 11A and 11B. It is recommended for black shank infested fields.

f. Burley 49 has more resistance to black root rot than any variety previously available, and it has a high level of resistance to lodging. It is especially recommended for use where black root rot and black shank, or both, are problems. Under these conditions, it produces much higher yields of good quality tobacco than susceptible or even moderately resistant varieties. Where these two root diseases are not problems, Burley 21 is likely to produce somewhat higher yields of better quality tobacco than Burley 49. Burley 49 has slightly more resistance to black shank and much better resistance to black root rot than Burley 37. Burley 49 resembles Burley 37, but has more closely spaced and shorter leaves on a shorter stalk, and even more of a stand-up growth habit. Burley 49 takes seven to ten days longer to bloom than Burley 37.

g. Burley 64 has high resistance to mosaic, wildfire, and black root rot, and medium resistance to black shank and fusarium wilt. The plants bloom late and should be topped to 22 or 23 leaves as soon as practical, regardless of whether they have begun to flower. This variety produces medium yields of high quality tobacco.

h. Va. 509 originated from a crop of Burley 21 x Burley 37. The appearance of Va. 509 is a fair composite of the two parents, though the plant type resembles the Burley 21 parent more than the Burley 37. The leaves are spaced about like Burley 21. The leaf shape and size also resemble Burley 21, but the top leaves are broader and probably not as long as Burley 21. The top leaves tend to twist slightly and wrinkle more than do the top leaves of either parent. The midrib is not as prominent as Burley 21 but more noticeable than Burley 37.

7.2.3 Characteristics of recommended hybrid varieties of tobacco.

a. Hybrids -- The names of the two parents used in making the hybrid will be the name of the hybrid and will be printed on each package offered for sale. When discussing or listing a hybrid, the female parent should always be first. For example, the hybrid MS Burley 21 x L8 means that MS Burley 21 is the female parent and L8 is the male parent. No differences have been found in yield or quality in MS Burley 21 x L8 or MS L8 x Burley 21.

b. Most hybrids offered for sale will be half Burley 21. This should improve smoking qualities and acceptance of the leaf. MS Ky. 14 x L8 should be more useful than MS21 x L8 where black root rot or fusarium wilt is a problem.

c. A hybrid may carry a lower degree of resistance to a certain disease than the more resistant parent. For example, the Burley 21 x Ky. 10 hybrid will have less black root rot resistance than Ky. 10 but more than Burley 21.

d. MS B 21 x Ky. 10 is a first-generation male sterile hybrid made by crossing Ky. 10 onto male sterile Burley 21. The hybrid has characteristics of both parents. Plant height and leaf number are about the same as Burley 21, but the leaves are larger and not as stand-up as Burley 21. The leaves are darker green and mature about five days earlier than Ky. 10 or four to five days later than Burley 21. The hybrid appears to hold the bottom leaves better than Burley 21. MS B 21 x Ky. 10 is a high yielding hybrid with higher quality leaf than Ky. 10. It has good resistance to tobacco mosaic and wildfire and a medium or low level of resistance to fusarium wilt and black root rot.

e. MS B 21 x Ky. 14 is a first-generation male sterile hybrid made by crossing Ky. 14 onto male sterile Burley 21. Plant height and leaf number are about the same as Burley 21. Leaves are a little wider and not as stand-up as Burley 21. The hybrid matures about three days earlier than Ky. 14 and about three days later than Burley 21. The hybrid appears to hold the bottom leaves better than Burley 21. It is a high yield hybrid with high leaf quality, and it possesses high resistance to wildfire and tobacco mosaic and medium to high resistance to black root rot and fusarium wilt. This hybrid will eventually replace the hybrid MS B 21 x Ky. 12.

f. MS B 21 x L8 is a first-generation male sterile hybrid made by crossing L8 onto male sterile Burley 21. The hybrid has characteristics of both parents. Plant height and leaf number are a little less than Burley 21, but the leaves are larger and not as stand-up as Burley 21. This hybrid matures a few days earlier than Burley 21. MS B 21 x L8 is a medium yielding hybrid with high quality leaves. It was developed for use on black shank land. It is highly resistant to race 0 but susceptible to race 1 of the black shank organism. This hybrid also has good resistance to wildfire, high resistance to tobacco mosaic, and a medium-low level of resistance to black root rot.

g. MS B 37 x L8 is a first-generation male sterile hybrid made by crossing L8 onto male sterile Burley 37. The hybrid has characteristics of both parents. Plant height and leaf number are about the same as Burley 37, but the leaves are a little larger and not as stand-up as Burley 37. The hybrid matures four to five days earlier than Burley 37. MS B 37 x L8 is a low yielding hybrid with good quality leaves. It is useful where race 0 black shank is a problem. The hybrid has good resistance to wildfire and high resistance to tobacco mosaic and race 0 black shank. The resistance to race 1 black shank is low.

h. MS Ky. 12 x L8 is a first-generation male sterile hybrid made by crossing L8 onto male sterile Ky. 12. The hybrid has characteristics of both parents with a little shorter plant and two or three fewer leaves than Ky. 12. The upper leaves are a little larger and not as stand-up as Ky. 12. The leaves are not as green and mature about seven days earlier than Ky. 12. MS Ky. 12 x L8 is a high yielding hybrid with good quality leaf. It has good resistance to tobacco mosaic, wildfire, black root rot, and high resistance to race 0 black shank.

i. MS Ky. 14 x L8 is a first-generation male sterile hybrid made by crossing Ky. 14 onto male sterile L8. Plant height and leaf number are somewhat less than Ky. 14, and the leaves are not as stand-up as Ky. 14. The hybrid matures about five days earlier than Ky. 14 or five to six days later than L8. MS Ky. 14 x L8 is a medium yielding hybrid with acceptable leaves. It has good resistance to wildfire and a medium-high level of resistance to fusarium wilt and black root rot. This hybrid has high resistance to tobacco mosaic and to race 0 black shank.

7.2.4 Black Shank Resistance.

If black shank is present in a field, seed a grass and/or legume, clean your equipment, and move to a new field. If, however, you are not able to control black shank by crop rotation, you'll have to use one of the resistant varieties.

a. Two types of black shank, race 0 and race 1, are found in Kentucky. Some varieties are resistant to only one race, and others resist both types.

b. Burley 21 x L8, for example, is highly resistant to race 0; however, it has no resistance to race 1.

c. It's no easy job to tell one race from the other. The safest plan is to grow a variety moderately resistant to both races, such as Burley 49 or Burley 37.

d. If the resistant varieties fail to control the disease, stop using that field for at least three years. If you return to that field, plant Ky. 17.

7.3 Supplementary Materials

References:
1. Kentucky Burley Tobacco Variety Tests, Progress Report 235.
2. Recommended Tobacco Varieties for Kentucky, AGR-13.
3. UK Ag Report - Special Tobacco Edition.
4. Use a Resistant Tobacco Variety, AGR-42.

Transparency Master: 7.2.1a, "Relative Disease and Aphid Resistance of Tobacco Varieties and Hybrids."

7.4 Check-Out Activities

Provide students with the following exercise:

1. Why is the proper selection of a tobacco variety so important?

2. Why is Burley 21 used in so many hybrids?

3. Which hybrid variety of burley has the lowest resistance to black root rot?

4. Which standard burley variety has little or no resistance to wildfire?

5. A hybrid may carry a lower degree of resistance to a certain disease than the more resistant parent. T F

ANSWERS:

1. It controls disease resistance and quality as well as yield
2. To improve smoking quality and acceptance of the leaf
3. MS B 37 x L8
4. Ky. 10
5. True

RELATIVE DISEASE AND APHID RESISTANCE OF TOBACCO VARIETIES AND HYBRIDS

Variety	Black Root	Mosaic	Fusarium Wilt	Wildfire	Black Shank	Aphid
			Standard Varieties			
Ky 10	Medium	High	Medium	*	*	*
Ky 12	Med-High	High	High	High	*	*
Ky 14	Med-High	High	High	High	*	*
Ky 15	High	High	Medium	High		
Ky 16	Low	*	*	*	*	**
B 21	Low	High	*	High	*	Med-Low
B 37	Low	*	Low	High	Medium[1]	Med-Low
B 49	High	High	*	High	Medium[1]	**
Ky 17	High	High	High	High	Medium[1]	**
			Hybrids			
MS B 21 x Ky 9	Med-Low	High	*	High	*	**
MS B 21 x Ky 10	Med-Low	High	Low	High	*	Low
MS B 21 x Ky 12	Medium	High	Med-High	High	*	*
MS B 21 x L-8	Med-Low	High	*	High	High[2]	Low
MS L-8 x B 37	Low	High	*	High	High[2]	Low
MS Ky 12 x L-8	Medium	High	Med-High	High	High[2]	*
MS Ky 14 x L-8	Medium	High	Med-High	High	High[2]	*

---

* Indicates little or no resistance

** Unknown

[1] Resistant to Race 0 and Race 1

[2] Resistant to Race 0

Source: Kentucky Burley Tobacco Variety Tests, Progress Report 235, 1972-1977.

8. PREPARING, FERTILIZING, AND SEEDING TOBACCO PLANTBEDS

8.1 Performance Objective

a. Given a written check-out activity concerning preparing, fertilizing and seeding tobacco plantbeds, students will complete the activity with 80 percent accuracy.

b. Given an unprepared plantbed site and the necessary tillage equipment, students will prepare a tobacco plantbed.

c. Given fertilizer, seed and necessary application equipment, students will fertilize and sow a plantbed after preparation of the soil. The fertilizer and seed will be spread evenly over the entire plantbed at the recommended rate, without skips or heavy concentrations.

8.2 Teaching-Learning Activities

a. This section on preparing, fertilizing, and seeding tobacco plantbeds can best be taught using the problem-solving procedure. Prepare appropriate lessons for use in class.

b. Develop and show a slide presentation series of an area tobacco producer correctly preparing, fertilizing, and seeding his plantbed. Show these slides in a step-by-step sequence depicting the proper practices to follow.

c. Take a field trip or use school land laboratory to have students actually prepare, fertilize, and seed a tobacco plantbed.

8.2.1 Preparing the plantbed for seeding. (See transparency master 8.2.1a.)

a. Properly preparing the tobacco plantbed for seeding is one of the major steps involved in producing a successful crop of burley tobacco. The proper soil tillage practices used in preparing the seedbed often determines whether the producer will have sufficient quantities of healthy vigorous tobacco plants to be transplanted to the field. Many plantbed problems can be traced to carelessness or poor practices in preparing the plantbed soil and seeding.

b. Regardless of whether permanent or temporary plantbeds are used, careful management practices in preparing the soil in the plantbed are essential. The tobacco producer should rake the plantbed to remove any rock, stubbles, or other foreign debris. The soil should be loose and fine-textured for seeding.

8.2.2 Applying fertilizer to the plantbed.

a. Not more than 50 pounds of a complete fertilizer containing about 5 pounds of nitrogen, 5 pounds of P_2O_5, and 5 pounds of K_2O should be used on 100 square yards (9 feet x 100 feet) of plantbed. This could be applied by using 50 pounds of a complete fertilizer such as 10-10-10. If you use much more than the amount given above, soluble salts may rise to the soil surface in dry weather and cause the plants to yellow and die.

  (1) The first visible symptom of over-fertilization is the yellowing of the seedlings. You will see a grayish-white substance covering the soil around the yellow plants. Examination of the seedlings will show that root growth is very poor.

  (2) The only remedy for over-fertilized tobacco plantbeds is heavy watering. You should apply about 500 gallons of water per 100 square yards of bed about every 4 or 5 days until the soil, when dry, no longer shows the grayish-white crystals and the tobacco seedlings have established new roots and have started to grow. If the weather continues to be dry, you must water at least once each week.

b. Fertilizer injury should not be confused with the yellowing of the seedlings due to nitrogen starvation or manganese toxicity.

  (1) When the tobacco plants turn yellow during seasonable weather, if they have a good root system, and if there is no grayish-white covering of the soil, then this yellowing is probably due to nitrogen starvation.

  (2) Six pounds of nitrate of soda or 3 pounds of ammonium nitrate broadcast evenly over the bed, with the canvas removed, should provide sufficient nitrogen. To prevent burning, follow at once with enough clear water to wash the fertilizer off the leaves.

8.2.3 Seeding the plantbed.

a. Sow 2 level teaspoons of certified seed to each 100 feet of bed 9 feet wide or 2½ level teaspoons of seed for each 100 feet of bed 12 feet wide. There are approximately 30,000 seeds in a level teaspoonful of tobacco seed. Seeding may be done as soon as weather permits, which is usually the last half of February or in March. Seeding should be completed by April 10.

b. When seeding, mix fine sand, screened wood ashes, or a small amount (10 pounds) of commercial fertilizer with the seed. Going over the bed at least three times helps to evenly distribute the seed if you are sowing by hand. Immediately after seeding, cover the bed with a good grade of tobacco cover.

8. PREPARING, FERTILIZING, AND SEEDING TOBACCO PLANTBEDS

8.1 Performance Objective

a. Given a written check-out activity concerning preparing, fertilizing and seeding tobacco plantbeds, students will complete the activity with 80 percent accuracy.

b. Given an unprepared plantbed site and the necessary tillage equipment, students will prepare a tobacco plantbed.

c. Given fertilizer, seed and necessary application equipment, students will fertilize and sow a plantbed after preparation of the soil. The fertilizer and seed will be spread evenly over the entire plantbed at the recommended rate, without skips or heavy concentrations.

8.2 Teaching-Learning Activities

a. This section on preparing, fertilizing, and seeding tobacco plantbeds can best be taught using the problem-solving procedure. Prepare appropriate lessons for use in class.

b. Develop and show a slide presentation series of an area tobacco producer correctly preparing, fertilizing, and seeding his plantbed. Show these slides in a step-by-step sequence depicting the proper practices to follow.

c. Take a field trip or use school land laboratory to have students actually prepare, fertilize, and seed a tobacco plantbed.

8.2.1 Preparing the plantbed for seeding. (See transparency master 8.2.1a.)

a. Properly preparing the tobacco plantbed for seeding is one of the major steps involved in producing a successful crop of burley tobacco. The proper soil tillage practices used in preparing the seedbed often determines whether the producer will have sufficient quantities of healthy vigorous tobacco plants to be transplanted to the field. Many plantbed problems can be traced to carelessness or poor practices in preparing the plantbed soil and seeding.

b. Regardless of whether permanent or temporary plantbeds are used, careful management practices in preparing the soil in the plantbed are essential. The tobacco producer should rake the plantbed to remove any rock, stubbles, or other foreign debris. The soil should be loose and fine-textured for seeding.

8.2.2 Applying fertilizer to the plantbed.

a. Not more than 50 pounds of a complete fertilizer containing about 5 pounds of nitrogen, 5 pounds of P_2O_5, and 5 pounds of K_2O should be used on 100 square yards (9 feet x 100 feet) of plantbed. This could be applied by using 50 pounds of a complete fertilizer such as 10-10-10. If you use much more than the amount given above, soluble salts may rise to the soil surface in dry weather and cause the plants to yellow and die.

(1) The first visible symptom of over-fertilization is the yellowing of the seedlings. You will see a grayish-white substance covering the soil around the yellow plants. Examination of the seedlings will show that root growth is very poor.

(2) The only remedy for over-fertilized tobacco plantbeds is heavy watering. You should apply about 500 gallons of water per 100 square yards of bed about every 4 or 5 days until the soil, when dry, no longer shows the grayish-white crystals and the tobacco seedlings have established new roots and have started to grow. If the weather continues to be dry, you must water at least once each week.

b. Fertilizer injury should not be confused with the yellowing of the seedlings due to nitrogen starvation or manganese toxicity.

(1) When the tobacco plants turn yellow during seasonable weather, if they have a good root system, and if there is no grayish-white covering of the soil, then this yellowing is probably due to nitrogen starvation.

(2) Six pounds of nitrate of soda or 3 pounds of ammonium nitrate broadcast evenly over the bed, with the canvas removed, should provide sufficient nitrogen. To prevent burning, follow at once with enough clear water to wash the fertilizer off the leaves.

8.2.3 Seeding the plantbed.

a. Sow 2 level teaspoons of certified seed to each 100 feet of bed 9 feet wide or 2½ level teaspoons of seed for each 100 feet of bed 12 feet wide. There are approximately 30,000 seeds in a level teaspoonful of tobacco seed. Seeding may be done as soon as weather permits, which is usually the last half of February or in March. Seeding should be completed by April 10.

b. When seeding, mix fine sand, screened wood ashes, or a small amount (10 pounds) of commercial fertilizer with the seed. Going over the bed at least three times helps to evenly distribute the seed if you are sowing by hand. Immediately after seeding, cover the bed with a good grade of tobacco cover.

8.3 Supplementary Materials

Reference: Tobacco Plantbed Management, AGR-38.

Transparency Master: 8.2.1a, "Steps Involved in Preparing, Fertilizing, and Seeding Plantbeds."

8.4 Check-Out Activities

a. Provide students with the following exercise:

1. Since tobacco seed are very small, some rocks and stubble will not hurt in the plantbed. T F

2. How many pounds of fertilizer should be used to fertilize a 9 x 100-foot plantbed?

3. What fertilizer analysis should be used for the plantbed?

4. How much seed should be used on a 9 x 10-foot plantbed?

5. What materials should the seed be mixed with when seeding the plantbed?

ANSWERS:

1. False
2. 50 pounds
3. 10-10-10
4. 2 level teaspoonfuls
5. Sand, screened wood ashes, commercial fertilizer

b. Have students prepare a plantbed. You may want to prepare a checklist to check students off as they complete the activity. Supervise students throughout the activity.

c. Have students fertilize and sow a plantbed. You may want to prepare a checklist to check students off as they complete the activity. Supervise students throughout the activity.

STEPS INVOLVED IN PREPARING, FERTILIZING AND SEEDING PLANTBEDS

1. RAKE PLANTBED TO REMOVE ROCKS, STUBBLE AND FOREIGN MATERIALS.
2. PREPARE THE SOIL FINELY TEXTURED AND LOOSE.
3. USE 50 POUNDS OR LESS OF A COMPLETE FERTILIZER FOR 100 SQUARE YARDS OF PLANTBED.
4. SOW 2 LEVEL TEASPOONS OF CERTIFIED TOBACCO SEED FOR EACH 100 FEET BY 9 FEET BED. (USE 2¼ TEASPOONS FOR 100 FEET BY 12 FEET BED.) (THERE ARE APPROXIMATELY 30,000 SEEDS PER LEVEL TEASPOONFUL.)
5. SEED THE BED BEFORE APRIL 10TH.
6. WHEN SEEDING, MIX FINE SAND, SCREENED WOOD ASHES OR FERTILIZER WITH THE SEED.
7. GO OVER THE BED THREE TIMES TO EVENLY DISTRIBUTE THE SEED, IF SOWN BY HAND.
8. IMMEDIATELY COVER THE PLANTBED AFTER SEEDING.

9. SELECTING AND USING TOBACCO PLANTBED COVERS

9.1 Performance Objective

a. Given a written check-out activity concerning selecting and using tobacco plantbed covers, students will complete the activity with 80 percent accuracy.

b. Given samples of possible plantbed covers with a list of advantages and disadvantages, the student will select the most economical and suitable cover. The cover selected will meet the standards of the instructor's checklist.

9.2 Teaching-Learning Activities

a. This section on selecting and using tobacco plantbed covers can best be taught using the problem-solving procedure. Prepare appropriate lessons for use in class.

b. Obtain samples of the various types of covers and show them to the students. Discuss the advantages and disadvantages of each cover type.

c. Take a field trip to see tobacco covers on a plantbed.

d. Make and use a transparency and/or handout from the transparency master at the end of this section.

9.2.1 Need for plantbed covers.

a. After the plantbed has been established (seed sown and incorporated into the soil), it is necessary to cover the bed. It is virtually impossible to obtain satisfactory germination of the tobacco seed and to raise the seedlings in the bed without some form of cover.

b. Tobacco growers have historically used some type of protective covering on tobacco seed beds. During the last century the most commonly used covering has been a coarsely woven cotton or cheesecloth. The cover serves two major purposes--provides warmth and reduces the rate at which the top layer of soil is dried. Because of the increased cost and scarcity of cotton covers and the faster growth of plants under nylon and polyester, there has been increased use of nylon and polyester in recent years.

9.2.2 Types of plantbed covers. (See transparency master 9.2.2a.)

There are several forms of covers available to tobacco producers on today's market. Cover types include cotton cloth, polyester, nylon, and even glass. Glass covered beds are not recommended primarily due to the fact that they are uneconomical and require more management.

9.2.3 Management of plantbed covers.

a. Good quality plants can be produced under nylon and perforated plastic, but conditions are different enough under these covers (as compared to cotton covers) to make it necessary to change certain management practices. Many growers have made the mistake of seeding their beds to be covered with polyester and nylon at the same time they had been seeding cotton-covered beds. Because of faster plant growth under polyester and nylon, the plants were ready for transplanting too early.

b. Research and grower experience has shown that when properly managed, plants can be produced in about 60 days after seeding under cotton covers and in up to about 10 days less under nylon and polyester. The only company presently producing cotton covers will not produce them after the 1980 crop year and their availability is unknown.

9.3 Supplementary Materials

References: 1. Timely Tobacco Topics, TTT No. 24.

2. Tobacco Plantbed Management, AGR-38.

Transparency Master: 9.2.2a, "Results of Plantbed Cover Tests Conducted in Virginia and North Carolina."

9.4 Check-Out Activities

a. Present the following expercise to the students:

1. It is virtually impossible to obtain satisfactory germination of tobacco seed without some form of cover. T F
2. What are the two main purposes for plantbed covers?
3. More tobacco producers are using nylon or polyester covers today rather than cotton covers. T F
4. A common mistake tobacco growers make when using nylon or polyester covers is to plant too late. T F
5. Plants can be produced in about _______ days after seeding under cotton covers.

ANSWERS:

1. True
2. Provides warmth, reduces rate of soil drying
3. True
4. False
5. 60

b. Instructor's Final Checklist

Provide students with samples of tobacco plantbed covers. Have students select the most suitable and economical cover according to the following checklist.

The cover chosen will:

1. Provide warmth to the soil and plants.
2. Reduce the rate at which the top layer of soil is dried.
3. Induce the correct rate of plant growth compared to the desired transplanting date.
4. Aid in controlling diseases and insects in the plantbed.
5. Be generally available at a low cost.

RESULTS OF PLANTBED COVER TESTS CONDUCTED IN VIRGINIA AND NORTH CAROLINA

Cover	Transplants/sq. yd.		
	1st Pulling	2nd Pulling	Total
	Virginia Tests[a]		
Cotton	44	66	110
Solid Plastic	42	44	86
Perforated Plastic	57	71	128
Nylon	66	56	122
	North Carolina Tests[b]		
Cotton	12	44	56
Solid Plastic	23	33	56
Perforated Plastic	65	64	129
Nylon	48	68	116

[a] -- Results of 3 tests conducted in 1974.

[b] -- Results of 33 tests conducted in 1972-74 (From N. C. Misc. Ext. Pub. No. 126).

Source: Timely Tobacco Topics.

10.4 Check-Out Activities

a. Present the following exercise to the students:

1. What insect is usually the first to appear in the spring in the plantbed?
2. Why should manure not be applied to plantbeds?
3. What insect chews the tobacco plant stem close to the ground?
4. What is the most common insecticide used for fleabeetles during post-seeding treatments?
5. What should the tobacco grower always remember when using insecticides?

ANSWERS:

1. Grubworm
2. Manure attracts grubworms
3. Cutworms
4. Sevin
5. Read and follow label directions

b. Provide student with a plantbed which has insect damage. Have student identify insect, select control method, apply proper materials and check bed for control.

1979 INSECTICIDE RECOMMENDATIONS FOR TOBACCO PLANTBEDS

Insect	Insecticide	Rate of Application
	Pre-Seeding Treatment	
Flea Beetle	*Di-Syston L5% G	2/3 lb. (9 ft. bed) 3/4 lb. (12 ft. bed)
Green June Beetle Grubs	*Methyl-Bromide	9 lb. (9 ft. bed) 12 lb. (12 ft. bed)
	Post Seeding Treatment	
Green June Beetle Grub	*Dylox 80% SP	2/3 lb. in 100 gal. water (9 ft. bed) 3/4 lb. in 100 gal. water (12 ft. bed)
	Sprays	(2-6 leaves)(7-12 leaves
Flea beetles	*Sevin - 50% WP	12 tbs.
	*Sevin - 80% S	9 tbs.
	*Sevin - 4 lbs. F	4 tbs. (use 3 gal. for above)
	*Orthene - 75% SP	2 tbs. in 3 gal. water
	Dusts	
	*Sevin - 10%	3/4 lbs.
	*Sevin - 5%	1½ lbs.
	Granules	
	*Di-Syston - 15%	2/3 lbs.
Cutworms	*Diazinon - 14% G	3/5 lb. per bed
	*Dylox - 5% bait	10 lbs. per bed
	*Sevin - 5% bait	½-1 lb. per bed
Slugs	*Methaldehyde Bait	(follow label directions

WP - Wettable powder; G - Granular; D - Dust; S - Sprayable; F - Flowable; SP - Soluble Powder; TBS - Tablespoon.

*Always read and follow directions concerning instructions, precautions and suggestions.

**Endorsement of trade names or products used is not intended nor is criticism implied of similar products not mentioned.

(Since these recommendations change each year, get up-to-date information.)

11. CONTROLLING DISEASES IN THE TOBACCO PLANTBED

11.1 Performance Objective

Given a written check-out activity concerning controlling diseases in the tobacco plantbed, students will complete the activity with 80 percent accuracy.

11.2 Teaching-Learning Activities

a. This section on controlling diseases in the tobacco plantbed can best be taught using the problem-solving procedure. Prepare appropriate lessons for use in class.

b. Obtain plants showing various diseases or have slides which show the diseases.

c. Obtain specimen labels of common fungicides to use in class.

d. Take a field trip to see tobacco diseases and/or their control.

e. Make and use a transparency and/or handout from the transparency master at the end of this section.

11.2.1 Plantbed diseases, symptoms and treatments. (See transparency master 11.2.1a.)

a. Wildfire--Wildfire is a bacterial disease that may cause some damage. It can be identified by a circular, yellow halo surrounding a small spot of dead tissue on the leaf. However, early symptoms on young, tender plants will show wet, soft rot on areas of the leaves. In advanced stages the plant may show white-yellowish buds. Cool, rainy weather provides conditions most conducive to an outbreak.

(1) Wildfire can be avoided by using resistant varieties such as Burley 21, Burley 37, Burley 49, Burley 64, MS Burley 21 x Ky. 10 and Va. 509.
(2) When non-resistant varieties are used, plantbeds should be treated with streptomycin sulfate or streptomycin nitrate. Apply weekly, starting when the plants have four leaves.

b. Blue mold--Blue mold is a fungus disease that may attack plants in the bed at any stage of growth. Blue mold develops most rapidly during cool, damp weather. The most dependable and practical control is spraying or dusting with a suitable fungicide. Such a treatment will prevent blue mold from occurring, but will not cure the disease after it has become established. Early symptoms of blue mold are yellow, sickly areas in the bed. The general appearance in the later stages is very much like that obtained from throwing scalding water on the plants.

c. Anthracnose--Anthracnose in plantbeds has caused losses in Kentucky the past few years. The fungus that causes anthracnose is a pathogen of grasses and clovers and is well distributed where tobacco is grown. Anthracnose may be introduced into plantbeds by water that flows over the beds from the outside. Plantbeds that are well ditched and raised above the surrounding ground should be safer than beds level with their surroundings.

(1) Anthracnose causes numerous small spots on tobacco leaves which, at first, are reddish-brown, but later turn paper-white, sometimes giving the plants a silvery appearance. Brown, elongated spots also appear on the undersides of leaf midribs and veins, causing the leaf to pucker or break. Several spots on a small leaf often merge into a single dead area, killing the entire leaf. The disease may be unusually severe in wet weather, killing large as well as very small seedlings. If not killed, the plants remain yellow and stunted as long as the disease remains active. Although anthracnose is checked by clear, dry weather, it can remain active over a wide temperature range.

(2) When anthracnose occurs, the following recommendations have proved effective. Spray or dust the beds with a fungicide such as Ferbam or Zineb (rates the same as for blue mold). A fine spray should be applied to insure coverage of both sides of the leaves, and dust should be applied with a hand-powered crank duster. Spray or dust two or three times a week until setting to prevent spread of the infection from localized areas.

(3) Antibiotics such as streptomycin, which is used for wildfire control, are of no value for anthracnose control.

d. Blackleg--Blackleg may occur in the plantbed during wet periods when the plants are about ready to be set. Blackleg is a bacterial soft rot which attacks leaves that touch the ground and spreads from the leaves into the soft, tender stalk. The stalk may rot off completely or the disease may spread up one side, splitting it open. The rooted areas usually turn black. Frequently, the plants in an area up to 3 feet in diameter are damaged. Slightly affected plants, when set in the field, grow normally if set in rather dry soil, but if the setting season is wet it is not advisable to use plants from an affected bed.

e. Damping-off (Bed Rot)--Damping-off is caused by organisms present in most soils. A destructive type affects very young seedlings just as they emerge, or very soon thereafter. A second type of damping-off occurs later and decays the plant stems at the ground surface. The disease is favored by high moisture and by excessive use of cottonseed meal, chicken manure, and other organic fertilizers. Regular spraying of the beds, as described for blue mold, gives good control of damping-off, providing applications are begun early enough. Fumigation of plantbeds with methyl bromide for weed seed control will also help reduce damping-off problems.

101

11.3 Supplementary Materials

References:
1. Burley Tobacco Production in Tennessee, Publication 358.
2. Tobacco Plantbed Management, AGR-38.
3. UK Ag Report - Special Tobacco Edition.

Transparency Master: 11.2.1a, "Tobacco Plantbed Diseases."

11.4 Check-Out Activities

a. Present the following exercise to the students:

1. How can wildfire be avoided?
2. Blue mold symptoms are characterized by yellow, sickly areas in the plantbed. T F
3. Ferbam or Zineb is the recommended treatment for which disease?
4. What causes blackleg in tobacco plantbeds?
5. Antibiotics such as streptomycin are a recommended treatment for anthracnose. T F

ANSWERS:

1. Using a resistant variety
2. True
3. Anthracnose
4. Bacterial soft rot
5. False

b. Show students plants, pictures, or slides and have them identify at least the five major diseases. Have students list characteristics of each disease and the recommended treatment(s).

TOBACCO PLANTBED DISEASES

WILDFIRE

BLUE MOLD

ANTHRACNOSE

BLACKLEG

DAMPING-OFF (BED ROT)

12. CHECKING PLANTBEDS REGULARLY

12.1 Performance Objective

Given a written check-out activity concerning checking plantbeds regularly, students will complete the activity with 80 percent accuracy.

12.2 Teaching-Learning Activities

a. This section on checking plantbeds regularly can best be taught using the problem-solving procedure. Prepare appropriate lessons for class use.

b. Build and operate a plantbed soaker. See instructions in Tobacco Plantbed Management.

c. Take a field trip to check a tobacco plantbed.

d. Use extension personnel or a tobacco producer as a resource person(s).

e. Make and use transparencies and/or handouts from the transparency masters at the end of this section.

12.2.1 Checking plantbeds regularly.

a. Dry weather frequently occurs in Kentucky in the spring. During dry weather, it is necessary to provide water to the plantbed in order to produce good plants. The need for water is determined by the type of soil on which the bed is situated, the time the bed was plowed, and the time and method of preparation. It is important to use water before injury starts rather than after damage occurs.

b. Water is necessary for the germination of tobacco seed and for normal plant growth and development. Growing plants take out large quantities of water from the soil. Without water, growth will be checked, plants injured, and in extreme cases, killed. Watering should be started early enough to promote normal growth of strong, thrifty plants.

c. Each time you check the plantbed, also look for insect and disease damage as well as any nutrient deficiencies.

12.2.2 Provide students with the reference, Tobacco Plantbed Management, AGR-38. Refer the students to page 11, Figure 5. Explain to the students how the plantbed soaker operates. The plantbed soaker can also be seen on transparency master 12.2.2a.

12.2.3 Construct a plantbed soaker like the one mentioned in Activity No. 12.2.2. This can be done in the agriculture shop at a nominal cost and would provide students the opportunity to construct a soaker that they could use on their own plantbeds. Custom work for area farmers could also be done.

12.3 Supplementary Materials

References:
1. Tobacco Plantbed Management, AGR-38.
2. UK Ag Report - Special Tobacco Edition.

Transparency Masters:
1. 12.2.1a, "Practices to Follow When Checking and Watering Plantbeds."
2. 12.2.2a, "Plantbed Soaker."

12.4 Check-Out Activities

Provide students with the following exercise:

1. Thorough watering every _______ or _______ days is better than a light watering every day.
2. Use _______ gallons of water for each 100 by 9-foot bed.
3. Use _______ gallons of water for each 100 by 12-foot bed.
4. What time period during the day should plantbed be watered?
5. Checking the plantbed also provides an opportunity for the tobacco producer to keep a close watch on disease and insects in the plantbed. T F

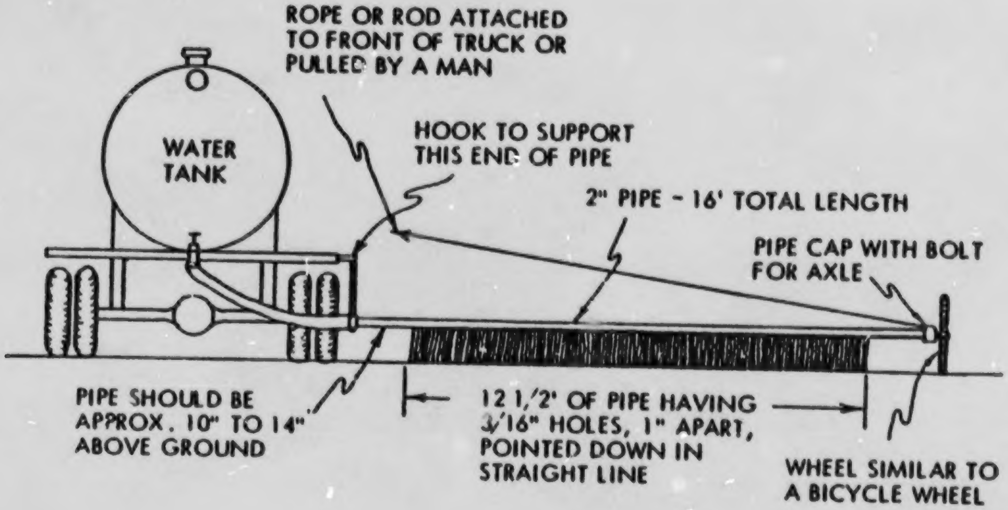
ANSWERS:

1. 3 or 4 days
2. 560 gallons
3. 750 gallons
4. Afternoon or evening
5. True

PRACTICES TO FOLLOW WHEN CHECKING AND WATERING PLANTBEDS

1. CHECK AND EXAMINE CLOSELY FOR NEEDED MANAGEMENT PRACTICES.
2. THOROUGH WATERING EVERY 3 OR 4 DAYS IS BETTER THAN A LIGHT WATERING EVERY DAY.
3. USE 560 GALLONS OF WATER FOR EACH 100 BY 9 FOOT BED. THIS WILL PROVIDE ONE INCH OF WATER OVER THE ENTIRE BED.
4. USE 750 GALLONS OF WATER FOR EACH 100 BY 12 FOOT BED. THIS PROVIDES ONE INCH OF WATER OVER THE ENTIRE BED.
5. WATER PLANTBEDS IN THE AFTERNOON OR EVENING TO PREVENT LOSS FROM EVAPORATION. THIS WILL ALLOW WATER TO SOAK INTO THE SOIL OVERNIGHT.
6. IF THE WEATHER IS HOT, THE COVER SHOULD BE REMOVED AFTER WATERING TO PREVENT SCALDING OF THE PLANTS.
7. IN DRY WEATHER, THE COVER SHOULD BE KEPT IN PLACE TO PREVENT WATER LOSS BY EVAPORATION.
8. WATER THE PLANTBED IMMEDIATELY AFTER A HARD FROST TO PREVENT COLD INJURY TO THE PLANTS.
9. WATERING ALSO PROVIDES A TIME FOR THE TOBACCO PRODUCER TO KEEP A CLOSE CHECK ON THE PLANTBED. CHECK FOR ANY DISEASES OR INSECTS THAT MAY BE PRESENT.

PLANTBED SOAKER


ROPE OR ROD ATTACHED TO FRONT OF TRUCK OR PULLED BY A MAN
WATER TANK
HOOK TO SUPPORT THIS END OF PIPE
2" PIPE - 16' TOTAL LENGTH
PIPE CAP WITH BOLT FOR AXLE
PIPE SHOULD BE APPROX. 10" TO 14" ABOVE GROUND
12 1/2' OF PIPE HAVING 3/16" HOLES, 1" APART, POINTED DOWN IN STRAIGHT LINE
WHEEL SIMILAR TO A BICYCLE WHEEL

TM 12.2.2a

Source: Tobacco Plantbed Management, AGR-38, p. 11.

13. REGULATING THE GROWTH OF TOBACCO PLANTS IN THE TOBACCO PLANTBED

13.1 Performance Objective

Given a written check-out activity concerning regulating the growth of tobacco plants in the tobacco plantbed, students will complete the activity with 80 percent accuracy.

13.2 Teaching-Learning Activities

a. This section on regulating the growth of tobacco plants in the tobacco plantbed can best be taught using the problem-solving procedure. Prepare appropriate lessons for class use.

b. Develop and show a slide presentation series of a successful tobacco producer in the community as he/she regulates the growth of plants in the plantbed. Obtain slides of as many regulating methods as possible. Discuss the slides in details as they are shown to the class.

c. If plantbeds are grown on the school grounds or on the school farm laboratory or if an area tobacco producer needs the plant growth regulated in the plantbed, supply the students with the necessary regulating equipment. Have the students promote or retard the growth in the plantbeds as necessary. Supervise work for correct procedures.

d. Obtain a label from an organic nitrogen fertilizer bag to discuss with the class.

13.2.1 Importance of regulating tobacco plant growth.

The needs of tobacco plants are always critical and should be met immediately. In order for the tobacco producer to obtain the proper size plants at transplanting time, it is necessary to control the rate of plant growth. This may include speeding up or slowing down the rate of growth.

13.2.2 Methods of regulating tobacco plant growth. (See transparency master 13.2.2a.)

The methods used in regulating plant growth in the plantbed are varied. They range from use of water and the application of nitrogen fertilizer to promote growth, to the use of mowers for clipping plants to retard growth.

13.2.3 Size of tobacco plants.

The tobacco producer should be aware of the proper transplanting date for the area (usually between May 20 to June 15 in Kentucky) and strive to have plants at the proper size by the date they will be needed. Plants should be six to ten inches tall, with a stalk diameter at least the size of a pencil.

13.3 Supplementary Materials

Reference: UK Ag Report - Special Tobacco Edition.

Transparency Master: 13.2.2a, "Methods of Regulating Tobacco Plant Growth."

13.4 Check-Out Activities

Provide students with the following exercise:

1. Why is it important to regulate tobacco plant growth?

2. Name one method of promoting plant growth in the plantbed.

3. Name one method of retarding plant growth in the plantbed.

4. Between what dates should tobacco be transplanted?

5. How tall should tobacco plants be when transplanted?

6. What diameter should tobacco plants be when transplanted?

ANSWERS:

1. To have the proper size plants at transplanting time
2. a. Water
   b. Nitrogen fertilizer
3. Clipping plants with a mower
4. May 20 to June 15
5. Six to ten inches
6. Not smaller than a pencil

110

METHODS OF REGULATING TOBACCO

PLANT GROWTH

PROMOTE GROWTH

APPLYING WATER

APPLYING NITROGEN FERTILIZER

OTHERS

RETARD GROWTH

CLIPPING

OTHERS

14. PREPARING THE TOBACCO PLANTBED FOR PULLING PLANTS

14.1 Performance Objective

Given a written check-out activity concerning the preparation of the tobacco plantbed for pulling plants, students will complete the activity with 80 percent accuracy.

14.2 Teaching-Learning Activities

a. This section on preparing the tobacco plantbed for pulling plants can best be taught using the problem-solving procedure. Prepare appropriate lessons for class use.

b. Take a field trip to see a plantbed correctly prepared for pulling plants.

c. Prepare the school's plantbed for pulling plants.

d. Make and use a transparency using the transparency master at the end of this section.

14.2.1 Preparing the plants for transplanting. (See transparency master 14.2.1a.)

To promote hardening or toughening of the plants, covers should be removed two or three days prior to pulling from the plantbed. Careful pulling of the plants from moist beds will result in the retention of a maximum number of roots. The plantbed should be thoroughly watered during the evening prior to the day of transplanting. This will allow a complete saturation of the soil by water and will allow plants to be removed without breaking the root system. Care should be taken not to bruise the plants when transplanting.

14.3 Supplementary Materials

Reference: UK Ag Report - Special Tobacco Edition.

Transparency Master: 14.2.1a, "Factors to Consider When Preparing Tobacco Plants for Transplanting."

14.4 Check-Out Activities

Provide students with the following exercise:

1. Why should the cover be removed from the plantbed before pulling the plants?

2. When should the cover be removed from the plantbed?

3. When should the plantbed be watered prior to transplanting?

FACTORS TO CONSIDER WHEN PREPARING TOBACCO PLANTS FOR TRANSPLANTING

- REMOVE THE COVER TWO TO THREE DAYS PRIOR TO TRANSPLANTING.
- WATER PLANTBED DURING THE EVENING PRIOR TO THE DAY OF TRANSPLANTING.
- RETAIN AS MANY ROOTS AS POSSIBLE WHEN PULLING.
- CARE SHOULD BE TAKEN NOT TO BRUISE PLANTS.

15. HANDLING TOBACCO PLANTS FROM PULLING TO TRANSPLANTING

15.1 Performance Objective

Given a written check-out activity concerning handling tobacco plants from pulling to transplanting, students will complete the activity with 80 percent accuracy.

15.2 Teaching-Learning Activities

a. This section on handling tobacco plants from pulling to transplanting can best be taught using the problem-solving procedure. Prepare the appropriate lessons for use in class.

b. Take a field trip to observe the correct way to handle tobacco plants from pulling to transplanting.

c. During a field trip or at the school have students properly handle the plants from pulling to transplanting.

d. Make and use a transparency using the transparency master at the end of this section.

15.2.1 Properly handling tobacco plants. (See transparency master 15.2.1a.)

a. Tobacco plants should be set in the tobacco field as soon after pulling as possible. However, due to various factors it may not be possible to transplant immediately from the plantbed to the field. Plants to be stored must be pulled one at a time from the bed when they are dry. They should be wrapped snugly in burlap or other porous material (feed bags are commonly used) and kept under cover in an upright position with the roots down. Keeping the roots downward prevents the stems from crooking. To prevent the roots from drying out, bundles should be placed on moist soil or sand. Space for air circulation should be left between each bundle. Plants should be examined daily for signs of rot. They should not be watered while in storage.

b. Many farmers operating with a small group of workers pull plants in the morning and transplant later in the day into the field. Transplants should be pulled one at a time and placed in some type of container and covered with burlap. Care should be taken not to bruise plants when pulling them from the bed. The plants should be placed in the shade to reduce wilting prior to setting in the field. Transplanting should never be attempted when the temperature is higher than 90°F.

15.3 Supplementary Materials

Reference: UK Ag Report - Special Tobacco Edition.

Transparency Master: 15.2.1a, "Storing and Handling Tobacco Plants."

15.4 Check-Out Activities

Provide students with the following exercise:

1. How many plants should be pulled at each time?
2. Transplanting should not be done when the temperature is above _______ °F.
3. Why should plants be stored in an upright position?
4. How often should stored plants be examined?
5. Stored plants should be watered daily. T F

ANSWERS:

1. One
2. 90°F
3. Prevents crooking of stems
4. Daily
5. False

STORING AND HANDLING TOBACCO PLANTS

1. PULL PLANTS ONE AT A TIME.
2. DO NOT BRUISE PLANTS WHEN PULLING.
3. DO NOT TRANSPLANT WHEN THE TEMPERATURE IS ABOVE 90°F.
4. STORE PLANTS BY WRAPPING THEM IN A POROUS MATERIAL OR PUT THEM IN A CONTAINER AND COVER THEM WITH A POROUS MATERIAL.
5. KEEP STORED PLANTS COVERED, DRY, AND IN AN UPRIGHT POSITION.
6. PREVENT ROOTS FROM DRYING BY PLACING PLANTS ON MOIST SAND OR SOIL.
7. PROVIDE AIR SPACE BETWEEN BUNDLES.
8. EXAMINE PLANTS DAILY FOR SIGNS OF ROT.
9. DO NOT WATER STORED PLANTS.
10. PLACE PLANTS THAT ARE TO BE TRANSPLANTED THE SAME DAY IN THE SHADE.

16. PREPARING THE TOBACCO PLANTBED FOR THE NEXT YEAR

16.1 Performance Objective

Given a written check-out activity concerning providing the tobacco plantbed for the next year, students will complete the activity with 80 percent accuracy.

16.2 Teaching-Learning Activities

a. This section on providing the tobacco plantbed for the next year can best be taught using the problem-solving procedure. Prepare appropriate lessons for class use.

b. Take a field trip to see a plantbed being properly taken care of for the next year.

c. Prepare the school's plantbed for the following year.

d. Make and use a transparency using the transparency master at the end of this section.

16.2.1 Managing the plantbed after transplanting has been completed. (See transparency master 16.2.1a.)

a. When setting is completed, the plantbeds should be plowed to destroy the remaining plants and reduce the possibility of carry-over of insects or diseases. The soil should be thoroughly prepared to provide a good seedbed and seeded to cowpeas, soybeans, or some other broad-leaved legume which will provide a dense covering during the summer. Fertilizing the legume ahead of seeding with a mixed fertilizer containing phosphate and potash, coupled with inoculation of the legume seed, provides for maximum growth of the crop and reduces the need for using chemical fertilizers on the plantbed in the spring. This program provides for highly fertile soils for growing the plants and prevents fertilizer injury to the young plants. Spring-plowed beds are almost certain to be contaminated by the wildfire bacteria unless they are thoroughly steamed or treated with methyl bromide.

b. Permanent plantbeds with a heavy growth of summer legume are helpful in controlling weeds, keeping the soil fertile and in good tilth, and in preventing wildfire in the plantbed and in the field.

16.3 Supplementary Materials

Reference: Tobacco Plantbed Management, AGR-38.

Transparency Master: 16.2.1a, "Need for Heavy Growth of Summer Legume on Plantbed."

16.4 Check-Out Activities

Provide the students with the following exercise:

1. When should the plantbeds be plowed?

2. Why should plantbeds be plowed after transplanting is completed?

3. What should be sown on the plantbed after plowing?

4. Heavy growth of legumes are helpful in controlling ______.

5. Heavy growth of legumes are helpful in reducing the need for ______ ______ on the plantbed in the spring.

ANSWERS:

1. Following transplanting
2. Reduces the carry-over of insects and diseases
3. Some type of broadleaf legume
4. Weeds
5. Commercial fertilizers

118

NEED FOR HEAVY GROWTH OF SUMMER LEGUME ON PLANTBED

1. HELPFUL IN CONTROLLING WEEDS.
2. KEEPS THE SOIL FERTILE AND IN GOOD TILTH.
3. PREVENTS WILDFIRE IN THE PLANTBED AND FIELD.

17. CHANGING SOIL FERTILITY LEVELS FOR TOBACCO PRODUCTION

17.1 Performance Objective

Given a written check-out activity on understanding the effect of soil fertility on tobacco production, students will complete the activity with 80 percent accuracy.

17.2 Teaching-Learning Activities

a. This section on understanding the effect of soil fertility on tobacco production can best be taught using the problem-solving procedure. Prepare appropriate lessons for class use.

b. Take a field trip to see some good, fertile tobacco fields.

c. Use extension personnel as resource persons.

17.2.1 Effect of soil fertility on tobacco production.

a. Burley tobacco is greatly influenced by proper soil management practices. Both yield and quality are improved by using adequate amounts of the proper nutrients; however, fertilizers alone will not insure maximum profits from the tobacco crop. Attention must be given to the chemical and physical characteristics of the soil used, soil drainage and the crops grown in rotation with tobacco.

b. Building up the fertility level of the soil enough to produce the desired quality and quantity of tobacco usually takes time. It is desirable to select a field for tobacco one to three years prior to growing the crop.

c. After selecting a good field for tobacco production, samples of the soil should be tested to determine how much fertilizer and lime the soil needs.

Reference should be made to the problem that the students had earlier in the year on: How Important is High Crop Production?

17.3 Supplementary Materials

References: 1. A Productive Tobacco Soil, Cir. 575-A.

2. UK Ag Report - Special Tobacco Edition.

17.4 Check-Out Activities

Provide students with the following exercise:

1. List two advantages of having fertile soil for tobacco production.

2. How many years should a tobacco field be selected before growing the crop?

3. Fertilizers alone will not insure maximum profits from the tobacco crop. T F

4. Since chemical fertilizer can be added at almost anytime, the fertility level of the soil is not important. T F

5. Chemical and physical properties of the soil are important. T F

ANSWERS:

1. Increased yield and quality
2. One to three
3. True
4. False
5. True

18. DETERMINING FERTILIZER REQUIREMENTS FOR TOBACCO SOIL

18.1 Performance Objective

a. Given a written check-out activity concerning fertilizing tobacco soil, students will complete the activity with 80 percent accuracy.

b. Given soil test results, the student will recommend the amount of nitrogen, phosphorus, and potash to apply to tobacco soils. Recommendations should be within 5 percent of the teacher's calculations based on transparency master 8.2.1a, and should be planned for high yield and good quality tobacco.

18.2 Teaching-Learning Activities

a. This section on fertilizing tobacco soil can best be taught using the problem-solving procedure. Prepare appropriate lessons for class use.

b. After the soil test results have been obtained from the tobacco field tested in lesson 4, have each student recommend the amount of nutrients (nitrogen, phosphorus, and potassium) to add to the soil.

18.2.1 Fertilization requirements. (See transparency masters 18.2.1a, 18.2.1b, and 18.2.1c.)

a. Tobacco requires relatively large amounts of fertilizer for good yields and high quality. Soil testing is the best available method of determining the kind and amount of fertilizer to use. Leaf quality is also improved by fertilization. A large part of the returns from fertilizing tobacco comes from the increase yield of the crop.

b. Nitrogen, phosphorus and potassium are nutrients of primary importance in the production of good burley tobacco.

18.2.2 Fertilization methods.

a. The method of fertilizer application is important for the survival and growth of the tobacco plant. The feeding roots of the tobacco plant, especially in the early growth stages, develop in a limited zone of soil around the plant.

(1) Band application may be used for early plant growth.
(2) Broadcast applications are often used when the fertilizer rate is high.
(3) Additional fertilizer (usually nitrogen) may be applied along side the growing plants; this is known as sidedressing.

b. Potash should not be applied in the chloride form (muriate of potash). The chloride in the potash causes the tobacco to be red and causes cured tobacco to hold an excessive amount of moisture. This will cause problems in that the tobacco will be too high in order. Fertilizers formulated for tobacco contain sulfate of potash. These formulations usually are a 1-2-3 ratio.

c. The analyses of tobacco fertilizer used most often are 5-10-15 or 6-12-18. Although a straight fertilizer may be used, in most cases this means going over the field at least two times to apply the fertilizer. In the past several years, using a mixed fertilizer has been just as economical as using a straight fertilizer. This may be even more important as the price of energy increases.

18.3 Supplementary Materials

References:
1. Burley Tobacco Production in Tennessee, Publication 358.
2. Tobacco Production, Bul. No. 245.
3. 1979 Lime and Fertilizer Recommendations, AGR-1.

Transparency Masters:
1. 18.2.1a, "Fertilizer Recommendations for Burley Tobacco."
2. 18.2.1b, "Fertilizer Recommendations for Burley Tobacco Continued."
3. 18.2.1c, "Sources of N, P, and K."

18.4 Check-Out Activities

a. Provide students with the following exercise:

1. What three nutrients must be supplied in large amounts?
2. What is a mixed fertilizer?
3. What type of potash must be added to tobacco?
4. What is sidedressing?
5. What element do we usually side dress with?

ANSWERS:

1. a. Nitrogen
   b. Phosphorus
   c. Potassium

2. Has more than one nutrient in it
3. Sulfate of potash
4. Fertilizer applied along side the growing plant
5. Nitrogen

b. Provide the students with soil test results. The students will recommend the correct amounts of nutrients (Nitrogen, Phosphorus, and Potash) to add to a soil area.

FERTILIZER RECOMMENDATIONS FOR BURLEY TOBACCO

NITROGEN

N LEVELS - PAST CROPPING HISTORY		LBS. N/A
LOW N LEVEL	(PROBLEM SOILS, OR 1ST YEAR TOBACCO FOLLOWING A POOR SOD CROP)	250-300 LBS.
MEDIUM N LEVEL	(1ST YEAR TOBACCO FOLLOWING A GOOD GRASS OR GRASS-LEGUME SOD)	200-250 LBS.
HIGH N LEVEL	(1ST YEAR TOBACCO FOLLOWING A GOOD LEGUME SOD OR LEGUME COVER CROP)	150-200 LBS.

Source: 1979 Lime and Fertilizer Recommendations.

FERTILIZER RECOMMENDATIONS FOR BURLEY TOBACCO CONTINUED

PHOSPHATE AND POTASH

SOIL TEST LEVEL (IN POUNDS)	LBS./A P_2O_5	 K_2O
VERY HIGH (ABOVE 80P, 375K)	0	0
HIGH (80-61P, 375-251K)	0-100	0-200
MEDIUM (60-30P, 250-165K)	100-150	200-300
LOW (BELOW 30P, 165K)	150-200	300-400

Source: 1979 Lime and Fertilizer Recommendations.

SOURCES OF N, P, AND K

AMMONIUM NITRATE	33 1/3%	NITROGEN
SUPERPHOSPHATE	18-22%	P_2O_5
TRIPLE SUPERPHOSPHATE	40-45%	P_2O_5
SULFATE OF POTASH (POTASSIUM SULFATE)	48%	K_2SO_4

Source: 1979 Lime and Fertilizer Recommendations.

19. PREPARING SOIL FOR TOBACCO TRANSPLANTS

19.1 Performance Objective

a. Given a written check-out activity concerning preparing soil for tobacco transplants, students will complete the activity with 80 percent accuracy.

b. Given step-by-step procedures and the necessary tillage equipment, the student will prepare the soil in the tobacco field. The soil will be tilled to the proper depth and texture recommended for tobacco growth by the Extension Service.

c. Given the fertilizer and the necessary implements and equipment, the student will apply fertilizer to the tobacco field. The fertilizer will be spread over the entire tobacco field at the correct rate, evenly and without skips or heavy concentration.

19.2 Teaching-Learning Activities

a. This section on preparing soil for tobacco transplants can best be taught using the problem-solving procedure. Prepare lesson plans for use in class.

b. Take a field trip to see a field properly prepared for tobacco transplants.

c. Make and use a transparency and/or handout using the transparency master at the end of this section.

d. Use extension or farm machinery personnel as resource persons.

19.2.1 Soil preparation (See transparency master 19.2.1a.)

a. Thorough preparation of the land before transplanting is highly important in tobacco production. With short rotation, most tobacco land is plowed in late fall or early spring. Plowing land in the fall tends to increase the hazards of erosion.

b. Tobacco land in cover crops should be broken at least six weeks prior to transplanting. Work the land down with a heavy drag after turning the soil to prevent too much drying of the soil. Disk or harrow to provide a good soil texture for the seedbed.

c. Soil-applied insecticides and herbicides should be applied at the recommended rate and time prior to transplanting.

d. The field should have a final tillage operation immediately before transplanting the crop, using a disk or harrow to provide good soil texture and eliminate weeds. It may be necessary to firm the soil with a drag or cultipacker.

19.3 Supplementary Materials

References:
1. Burley Tobacco Production in Tennessee, Publication 358.
2. Tobacco Production, Bulletin No. 245.
3. UK Ag Report - Special Tobacco Edition.

Transparency Master: 19.2.1a, "Procedure to Follow for Tobacco Soil Preparation."

19.4 Check-Out Activities

a. Provide students with the following exercise:

1. When should soil be plowed for tobacco?
2. Name an important reason why fall plowing should be avoided.
3. What can we do to the soil after plowing to prevent drying and level the soil?
4. Why should we harrow the soil just before setting?
5. Thorough preparation of the land before transplanting is important. T F

ANSWERS:

1. At least six weeks prior to planting
2. Causes more erosion
3. Work land down with a drag
4. To provide good texture for the seedbed and eliminate weeds
5. True

b. Check students out step-by-step to determine that they can properly till soil for a tobacco field.

c. Check students out on applying fertilizer evenly over the entire field at the correct rate.

PROCEDURES TO FOLLOW FOR TOBACCO SOIL PREPARATION

1. PLOW LAND EITHER IN LATE FALL OR EARLY SPRING.
2. PLOW AT A DEPTH OF SIX INCHES.
3. BREAK SOIL THAT IS IN SOD OR COVER CROPS BEFORE GROWTH IS EXCESSIVE.
4. BREAK SOIL IN SOD OR COVER CROPS AT LEAST SIX WEEKS BEFORE TRANSPLANTING.
5. AFTER PLOWING, WORK THE LAND DOWN WITH A DRAG TO PREVENT THE SOIL FROM DRYING TOO FAST.
6. DISK OR HARROW THE TOBACCO SOIL TO OBTAIN THE PROPER TEXTURE.
7. APPLY FERTILIZER TO THE SOIL.
8. APPLY INSECTICIDES AND HERBICIDES TO THE SOIL.
9. DISK OR HARROW THE LAND IMMEDIATELY BEFORE SETTING THE CROP.

20. UTILIZING FARM RESIDUES

20.1 Performance Objective

Given a written check-out activity concerning utilizing farm residue, students will complete the activity with 80 percent accuracy.

20.2 Teaching-Learning Activities

a. This section on utilizing farm residue can best be taught using the problem-solving procedure. Prepare appropriate lessons for class use.

b. Take a field trip to see farm residues being utilized properly.

c. Use extension, soil conservation, or other such persons as resource persons.

d. Make and use transparencies and/or handouts using the transparency masters located at the end of this section.

20.2.1 Kinds of farm residues (See transparency masters 20.2.1a, 20.2.1b, 20.2.1c and 20.2.1d.)

a. Several types of farm residues are available which provide plant food nutrients to the soil. Residues commonly found on most farms and that can be used on tobacco include: livestock manures, cover crops and tobacco stalks. These residues improve the physical condition of the soil and add important amounts of nitrogen, phosphorus and potassium as well as needed micronutrients.

b. Excess amounts of residue, particularly farm manure, used immediately ahead of a tobacco crop can be injurious early in the growing season. Soil microbes that decompose organic matter give off a toxic substance which causes injury to the root system of young tobacco plants. Therefore, manure applications in excess of 10 tons per acre is not recommended.

20.3 Supplementary Materials

References:
1. A Productive Tobacco Soil, Cir. 575-A.
2. Burley Tobacco -- Transplanting to Harvest, Publication 293.
3. Farm Manure: Production, Value, Use, ID-19.
4. Tobacco Stalks and Stems, AGR-23.

Transparency Masters:
1. 20.2.1a, "Average Amounts of Primary, Secondary, and Micronutrients Supplied by the Different Kinds of Livestock."
2. 20.2.1b, "Uses and Benefits of Farm Residues for Tobacco Production."
3. 20.2.1c, "Average Composition of Burley Tobacco Stalks and Stems."
4. 20.2.1d, "The Average Amounts of Various Nutrients in Burley Stalks and Stems that are Available the First Year of Application."

20.4 Check-Out Activities

Provide students with the following exercise:

1. Name three residues that may be added to tobacco soil.
2. How many tons of manure per acre can be added to the soil with safety?
3. What three nutrients are most abundant in farm residue?
4. What should be done with tobacco stalks if disease is a problem?

ANSWERS:

1. a. Livestock manures
   b. Cover crops
   c. Tobacco stalks
2. 10 tons
3. a. Nitrogen
   b. Phosphorus
   c. Potassium
4. Put them on land not to be used for tobacco, such as other field crops or pasture.

AVERAGE AMOUNTS OF PRIMARY, SECONDARY AND MICRONUTRIENTS SUPPLIED BY THE DIFFERENT KINDS OF LIVESTOCK

Kind of Animal	*(N	P_2O_5	K_2O)	**(Ca	Mg	S	B	Cu	Fe	Mn	Mo	Zn)
Dairy Cattle	11.2	4.6	12.0	5.6	2.2	1.0	.03	.01	.08	.02	.002	.03
Fattening Cattle	14.0	9.2	10.8	2.4	2.0	1.7	.04	.01	.08	.01	.001	.03
Hogs	10.0	6.4	9.1	11.4	1.6	2.7	.08	.01	.56	.04	.002	.12
Horses & Mules	13.8	4.6	14.4	15.7	2.8	1.4	.03	.01	.27	.02	.002	.03
Sheep	28.0	9.6	24.0	11.7	3.7	1.8	.02	.01	.32	.02	.002	.05
Chickens	31.2	18.4	8.4	74.0	5.8	6.2	.12	.03	.93	.18	.011	.18

*Pounds of daily production per 1,000 lbs. live weight.
**Pounds of nutrients per ton of manure.

Source: Farm Manure: Production-Value-Use, ID-19.

USES AND BENEFITS OF FARM RESIDUES FOR TOBACCO PRODUCTION

I. LIVESTOCK MANURE

- A. MANURE IMPROVES THE PHYSICAL STRUCTURE OF THE SOIL.
- B. MANURE VARIES IN FERTILIZER VALUE FROM FARM TO FARM.
- C. MANURE VARIES IN FERTILIZER VALUE BETWEEN KINDS OF ANIMALS.

II. COVER CROPS

- A. COVER CROPS SHOULD BE PLANTED ON TOBACCO FIELDS EACH FALL.
- B. COVER CROPS PREVENT EROSION.
- C. COVER CROPS PROVIDE HIGH AMOUNTS OF NITROGEN TO THE SOIL.

III. TOBACCO STALKS

- A. STALKS CONTAIN 5 TIMES AS MUCH N, 2 TIMES AS MUCH P AND 9 TIMES AS MUCH K AS MANURE.
- B. CARE SHOULD BE TAKEN WHEN SPREADING STALKS TO PREVENT THE SPREAD OF TOBACCO DISEASES.
- C. WHOLE STALKS MAY INTERFERE WITH SOME TILLAGE PRACTICES.

AVERAGE COMPOSITION OF BURLEY TOBACCO STALKS AND STEMS

	TOTAL POUNDS PER TON				
	N	P*	K*	CA	MG
STALKS	56	5	75	36	5
STEMS	50	5	145	70	8

*Values for phosphorus (P) can be converted to P_2O_5 by multiplying by 2.29 and potassium (K) can be converted to K_2O by multiplying by 1.2.

Source: Tobacco Stalks and Stems: Fertility, Value, Use, AGR-23.

THE AVERAGE AMOUNTS OF VARIOUS NUTRIENTS IN BURLEY STALKS AND STEMS THAT ARE AVAILABLE THE FIRST YEAR OF APPLICATION

	POUNDS AVAILABLE PER TON				
MATERIAL	N	P*	K*	CA	MG
STALKS	30	4	62	15	3
STEMS	27	4	116	50	6

*Values for phosphorus (P) can be converted to P_2O_5 by multiplying by 2.29 and potassium (K) can be converted to K_2O by multiplying by 1.2.

Source: Tobacco Stalks and Stems: Fertility, Value, Use, AGR-23.

21. USING CHEMICALS TO CONTROL WEEDS IN THE TOBACCO FIELD

21.1 Performance Objective

a. Given a written check-out activity concerning using chemicals to control weeds in the tobacco field, students will complete the activity with 80 percent accuracy.

b. Given a choice of possible herbicides for controlling weeds in the tobacco field, the necessary application equipment and a prepared tobacco field, the student will select a herbicide and apply that herbicide to the tobacco field. The choice and rate of application of herbicide will be in agreement with Kentucky Agricultural Experiment Station recommendations and will be applied evenly over the entire field.

21.a Teaching-Learning Activities

a. This section on using chemicals to control weeds in the tobacco field can best be taught using the problem-solving procedure.

b. Take a field trip to see good weed control application and/or results.

c. Obtain specimen labels for herbicide containers.

d. Use extension or chemical company personnel as resource persons.

e. Make transparencies and/or handouts using the transparency masters at the end of this section.

f. Have the students determine the herbicide and rate to use for a tobacco field on a "case" or sample farm, a tobacco field grown on the school grounds, or a school farm laboratory, if available.

g. Provide the students with the correct herbicide and the necessary application equipment. Have students apply herbicide to the field in activity f. above. Check for accuracy in rate and method of application.

21.2.1 Effects of herbicide use. (See transparency masters 21.2.1a and 21.2.1b.)

a. In recent years herbicides for use on tobacco have become readily available. These herbicides are fairly effective in controlling grass and weeds but at least one supplemental cultivation is still usually desirable. At the present time it seems that the primary advantage in using herbicides for burley tobacco would be to control grass and weeds in the row, thus eliminating hand hoeing and reducing the amount of labor. Herbicides will also help to control grass and weeds in seasons when cultivation must be delayed because of wet weather.

b. It is important to point out that the residual effect of some herbicides may prevent getting a stand of grass or small grain following the tobacco crop unless the land is plowed. This has been a concern to tobacco producers.

c. There is usually no yield advantage in using herbicides compared with clean cultivated tobacco, and some slight reduction might be expected. The individual labor situation will determine whether herbicides should be used.

21.3 Supplementary Materials

References:
1. Chemical Control of Weeds in Farm Crops in Kentucky, AGR-6.
2. Weed Control Notes - Weed Control in Tobacco, Control Series 53.
3. 1976 Virginia Weed - Disease Control Guide, CS 53.

Transparency Masters:
1. 21.2.1a, "Herbicide Use in the Tobacco Field."
2. 21.2.1b, "Herbicide Use in the Tobacco Field Continued."

21.4 Check-Out Activities

a. Provide students with the following exercise:

1. What herbicides are available for tobacco?
2. List two classes of weeds that both Balan and Enide will control.
3. What weed will Tilliam kill that both Balan and Enide won't?
4. Which one of the herbicides may injure the roots of plants?

ANSWERS:

1. a. Tillam
   b. Balan
   c. Enide
2. a. Annual grasses
   b. Broadleaf weeds
3. Nutgrass
4. Balan

b. Have students apply a herbicide to a tobacco field and check them out against the University of Kentucky Agricultural Experiment Station recommendations. Any use of agricultural chemicals calls for special emphasis on safety.

HERBICIDE USE IN THE TOBACCO FIELD

Crop	Formulation Amount Per Acre of Area Actually Treated	Herbicide (lb Actual/A)	Time of Application	Weeds Controlled	Remarks
Tobacco	2 2/3 qt Tillam 6E or 40 lb Tillam 10G	pebulate 4	Before transplanting	Annual grasses, nutgrass, and broadleaf weeds	Incorporate immediately after spraying, preferably in same operation. See incorporation directions on label. Do not mix Tillam 10G with other granular pesticides or fertilizers.
Tobacco	3 to 4 qt. Balan 1.5 E (burley and dark) or 45 to 60 lb Balan 2.5 G (burley only)	benefin 1 to 1.5	Before transplanting	Annual grasses and broadleaf weeds	PLANTS GROWING UNDER STRESS CONDITIONS (LOW TEMPERATURE, HIGH MOISTURE, ETC.) MAY BE INJURED WHERE BALAN IS USED. Incorporate thoroughly into soil immediately after application. See incorporation directions on label. DO NOT INCORPORATE DEEPER THAN 2". Set plants in an upright position so that roots extend below the treated layer of soil. Use lower rate on loam and silt (medium soils), and high rate on clay (heavy soils). Do not mix Balan 2.5G with other granular pesticides or fertilizers. Even distribution of the herbicide is important. DO NOT APPLY MORE THAN THE RECOMMENDED RATE.

HERBICIDE USE IN THE TOBACCO FIELD CONTINUED

Crop	Formulation Amount Per Acre of Area Actually Treated	Herbicide (lb Actual/A)	Time of Application	Weeds Controlled	Remarks
Tobacco	1 qt Paarlan (burley and dark)	isopropalin 1.5	Before transplanting	Annual grasses and broadleaf weeds	Incorporate immediately after spraying, preferably in same operation. See incorporation directions on label. PLANTS GROWING UNDER STRESS CONDITIONS (LOW TEMPERATURE, HIGH MOISTURE, ETC.) MAY BE INJURED WHERE PAARLAN IS USED.
Tobacco	10 to 12 lb. Enide 50W	diphenamid 5 to 6	Preplant, post transplant, or at layby	Annual grasses and many broadleaf weeds	Can be applied preplant, post transplant, or at layby. See label for instructions. Do not use more than a total of 16 pounds of Enide 50W per acre when more than one application is used. Small grains and grasses sown after tobacco harvest may be injured by residues of Enide in the treated soil. Use a known cover crop such as vetch.

Source: Chemical Control of Weeds in Farm Crops in Kentucky, AGR-6.

22. CONTROLLING INSECTS IN THE TOBACCO FIELD

22.1 Performance Objective

a. Given a written check-out activity concerning controlling insects in the tobacco field, students will complete the activity with 80 percent accuracy.

b. Given a field of tobacco between transplanting and harvesting, the proper insecticides and the necessary application equipment, the student will control insects in the tobacco field. The insecticide will be evenly sprayed or dusted at the rate specified on the container, over the entire tobacco field. Safety precautions will be observed and the insect infestation will be under control.

22.2 Teaching-Learning Activities

a. This section on controlling insects in the tobacco field can best be taught using the problem-solving procedure. Prepare lesson plans for use in class.

b. Explain to the class what foliage and systemic insecticides are and how they work as well as the advantages and disadvantages of each kind. Using the chart on the bulletin ENT 15, have the students select the best insecticide to control each insect.

c. Show students the transparency, "Major Insects Affecting Burley Tobacco." (See transparency master 22.2.1a.) Have each student select an insect and make a report to the class concerning that particular insect. Be sure the students cover such items in their reports as physical characteristics of the insect, methods of control, insecticides to use, rate of application and safety precautions. Have students copy information brought out in class into their notebooks for later reference.

d. Provide students with copies of reference materials on tobacco insects and their control. Conduct a class discussion pertaining to the insects which were not reported on in class. Have students copy this information into their notebooks.

e. Obtain samples for demonstrations and/or develop and show a slide presentation of the various types of insects affecting tobacco in the field. Have students learn to identify these insects.

f. Invite an Extension entomologist to make a presentation on the insects affecting tobacco in the field.

g. Provide students with the necessary insecticide and application equipment to control insects on the tobacco field on the school ground or school laboratory farm (if any), a prominent community tobacco producer's field, or a student's experience program tobacco field. Have the students control the insect(s) in the tobacco field. Supervise the students for correct application.

22.2.1 Insect control programs. (See transparency masters 22.2.1a, 22.2.1b, and 22.2.1c.)

a. An effective insect control program can increase tobacco yields by as much as 200 pounds per acre. However, using pesticides when they are not needed is expensive and may have an adverse effect on the crop and the environment.

b. Insects attack tobacco in the field from the time it is transplanted until it is harvested. The tobacco producer should be on constant lookout for the various types of insects which affect the tobacco crop and should be aware of the way the insects look as well as their destructive habits. Some insecticides are taken up by the plant and become part of the plant, at least for a while. These materials are called systemics. After identification of the insects, the tobacco producer must know the proper methods used to control them.

22.3 Supplementary Materials

Reference:
1. Burley Tobacco - Transplanting to Harvest, Publication 293.
2. Insecticide Recommendations for Tobacco Fields, 1979, ENT-15.
3. Tobacco Production, Bulletin No. 245.
4. UK Ag Report - Special Tobacco Edition.

Transparency Master:
1. 22.2.1a, "Major Insects Affecting Burley Tobacco."
2. 22.2.1b, "When to Apply Controls."
3. 22.2.1c, "Comparative Effectiveness of Foliar and Systemic Insecticides."

22.4 Check-Out Activities

a. Provide students with the following exercise:

1. List five insects that affect tobacco.
2. What is a systemic insecticide?
3. Before applying an insecticide, what should you do first?

ANSWERS:

1. a. Aphids
   b. Budworms
   c. Cutworms
   d. Flea Beetles
   e. Grasshoppers
   f. Green June Beetle
   g. Hornworms
   h. Root Webworm
   i. Seed Corn Maggot
   j. Slug
   k. Suckfly
   l. Tobacco Thrips
   m. Vegetable Weevil
   n. Wireworms

2. One that is taken up by the plant.
3. Read the directions.

b. Have students apply an insecticide to a tobacco field and check them out against the University of Kentucky Agricultural Experiment Station recommendations. Special attention needs to be paid to safety precautions since many insecticides are very poisonous to man and animals, as well as a hazard to the environment, if used improperly.

MAJOR INSECTS AFFECTING BURLEY TOBACCO

APHIDS

BUDWORMS

CUTWORMS

FLEA BEETLES

GRASSHOPPERS

GREEN JUNE BEETLE

HORNWORMS

ROOT WEBWORM

SEED-CORN MAGGOT

SLUG

SUCKFLY

TOBACCO THRIPS

VEGETABLE WEEVIL

WIREWORMS

WHEN TO APPLY CONTROLS

Needless insecticide applications to our tobacco cost valuable production dollars. Timely application of these chemicals, however, lowers the insect damage to the crop and keeps insecticide residues at acceptable levels.

Visual inspection of your crop will help you determine the presence and activity of the major pests. When insect activity reaches levels indicated in this table, application of recommended insecticides will be worthwhile.

	DAMAGING LEVEL Number of Insects		
Insect Pest	Per plant	Per 100 plants	Time of Damage
Flea Beetles	3 or more	-	Newly transplanted
	25 or more	-	knee-high or larger
Aphids	300 or more	-	July to cutting
Budworms	-	5	June and August
Hornworms	-	5	July to cutting
Grasshoppers	Activity in Field Borders	-	August to cutting

Source: 1979 Insecticide Recommendations for Tobacco Fields, ENT-15.

COMPARATIVE EFFECTIVENESS OF FOLIAR AND SYSTEMIC INSECTICIDES

This chart was prepared to indicate to growers how the insecticides recommended for use on tobacco compare for insect control. If there is more than one insect damaging tobacco, the grower might want to pick out the insecticide which would give the best overall control for the insects which are present. NOTE: The meaning of the rating designations in this table are self evident, however, explanation is in order for "NL", which indicates not labeled for use on this pest, and "-" which indicates that research data on performance is not conclusive.

Insecticides	Control of --					Hazard to Humans
	Aphids	Budworms	Flea Beetles	Hornworms	Grasshoppers	
Guthion (azinphosmethyl)	Fair	Poor	Good	Good	Fair	Mod.-High
Bacillus thuringiensis	NL	Fair	NL	Good	NL	Low
Sevin (carbaryl)	Do not use	Fair	Good	Good	Fair	Low
Di-Syston (disulfoton)	Good (early)	NL	Good	NL	NL	High
Thiodan + Malathion (with or without pyrethrins)	Fair	Fair	Poor	Fair	-	Mod.-High
Malathion	Fair-Good	NL	NL	NL	NL	Low
Lannate or Nudrin (methomyl)	Fair-Good	Good	Good	Good	NL	Moderate
Azodrin	Fair-Good	Good	NL	Good	NL	Moderate
Supracide	NL	Fair	Good	Good	NL	Moderate
Orthene (acephate)	Good	Good	Good	Good	NL	Low
Furadan (carbofuran)	NL	NL	Good	NL	NL	Moderate
Diazinon	Fair-Good	NL	Fair	NL	Fair	Low
Penncap M	Fair-Good	-	NL	Good	NL	Moderate
Dylox/Proxol	NL	Good	NL	Good	NL	Moderate
Cygon	Good	NL	NL	NL	NL	Moderate
Vydate	NL	NL	Good (early)	NL	NL	High

Source: 1979 Insecticide Recommendations for Tobacco Beds, ENT-14.

23. TRANSPLANTING TOBACCO

23.1 Performance Objective

a. Given a written check-out activity concerning transplanting tobacco, students will complete the activity with 80 percent accuracy.

b. Given the necessary reference material and equipment, the student will adjust the equipment and transplant tobacco plants in the field at the recommended stage and spacing.

23.2 Teaching-Learning Activities

a. This section on transplanting tobacco can best be taught using the problem-solving procedure. Prepare appropriate lessons for use in class.

b. Provide the students with a tobacco transplanter and the operator's manual for the transplanter. Have the students adjust the plant spacing and row spacing to the recommended distance. He/she will also adjust the water to the recommended amount. Provide the students with a prepared field. Have the students transplant the plants at the proper spacing and depth of planting.

23.2.1 Tobacco transplanting methods.

In order for mechanical tobacco transplanters to work properly, they must be able to penetrate the soil well and to firm the loose soil around the roots and stem of each transplant. One deep disking prior to transplanting is desirable to loosen the soil near the root zone. Soil insecticides and herbicides used before transplanting should be applied and disked lightly into the soil. Further trips over the field prior to transplanting should be kept to a minimum.

Transplanting must be done when the plants are of proper size. They should be six to ten inches tall, with a stalk diameter at least the size of a pencil. They usually reach this size between May 20 and June 15 and are ready for transplanting over a seven to ten-day period. Heavy rainfall can make it impossible to transplant during this period. If this condition occurs, the plants can be successfully stored for several days.

Burley plants are transplanted into the field in rows spaced 38 to 42 inches apart. Plant spacing in the row varies from 16 to 20 inches. The usual spacing is 18 by 40 inches, which gives a plant population of 8,700 plants per acre.

Dark air-cured and dark fire-cured plants are usually spaced 36 inches apart in rows that are 42 inches wide.

Machines are now used to transplant almost all tobacco grown in Kentucky. Most of the machines are one-row transplanters drawn by small tractors. They open a furrow, deliver a plant and a measured amount of water into the furrow, release the plant, seal the furrow and firm the soil around each transplant--all in a one-pass operation. A one-row transplanter requires a crew that includes a tractor driver and two persons to place plants in the mechanical fingers which actually place the plants in the soil.

Plenty of water--about 250 to 300 gallons per acre--is required for properly watering transplants. Extreme caution should be used to avoid contamination of transplanter water by disease-causing organisms. Water should be drawn from ponds and springs that are free from contamination. River or creek water should never be used for transplanting because of the possibility of spreading diseases onto the farm.

During extremely hot weather, transplants may suffer from severe dehydration. A good practice is to delay transplanting when the temperature is 90°F or above, or transplant only during the late afternoon or early evening.

This section taken from UK Ag Report - Special Tobacco Edition.

23.3 Supplementary Materials

References: 1. Operator's manual for the mechanical transplanter.

2. UK Ag Report - Special Tobacco Edition.

23.4 Check-Out Activities

a. Provide students with the following exercise:

1. When should we transplant tobacco?

2. What should the size of the plant be?

3. What should the plants be stored in after pulling?

4. What is the proper spacing of the plants in the field?

5. How much water should be used per acre?

6. What should the temperature be when transplanting?

ANSWERS:

1. Between May 15 and June 15
2. 6" to 10" tall and stems at least the size of a pencil
3. Wrapped snugly in burlap or other porous materials, kept under cover in an upright position with the roots down
4. Less than 10,000 plants per acre, rows 39" apart, plants 16" apart

5. 250-300 gallons per acre
6. Below 90°F

b. The student will transplant tobacco and will be checked to see that each of the following is done correctly:

Size of plants pulled;
Handling of plants after pulling;
Plant spacing in the field;
Amount of water per plant;
Depth of setting of plants.

24. CULTIVATING TOBACCO

24.1 Performance Objective

a. Given a written check-out activity concerning cultivating tobacco, students will complete the activity with 80 percent accuracy.

b. Given a tobacco field with young growing plants and the necessary cultivating equipment, the student will cultivate tobacco. The tobacco will be cultivated at the depth recommended by the University of Kentucky Agricultural Experiment Station. No plants will be covered with soil or uprooted.

24.2 Teaching-Learning Activities

a. This section on cultivating tobacco can best be taught using the problem-solving procedure. Prepare appropriate lessons for class use.

b. Take a field trip to see tobacco cultivated and/or observe results of cultivation and/or to demonstrate proper procedure in cultivation.

c. Provide students with a field of growing tobacco plants and the necessary implements for cultivating the tobacco crop. Demonstrate cultivation techniques based on the University of Kentucky Agricultural Experiment Station recommendations. Then have the students properly cultivate the tobacco field.

24.2.1 Effects of cultivating tobacco fields.

a. The chief benefit of cultivation is to control weeds. Another benefit is to keep the soil surface loose so water run-off will be slowed. Cultivation should be shallow. Cultivate only as often as needed to break the soil crust and control weeds.

b. Herbicides are often used along with cultivation to do a more thorough job of weed control than cultivation does alone. (Refer to section 21 of this unit - Using Chemicals to Control Weeds in the Tobacco Field.) This is especially true in over-the-row treatment, which eliminates hand hoeing in most cases.

c. No more than two or three cultivations are normally necessary. Cultivation should be discontinued if it causes damage to the leaves.

24.3 Supplementary Materials

References:
1. Burley Tobacco Production . . . In Tennessee, Publication 358.
2. Burley Tobacco: Transplanting to Harvest, Publication 293.
3. UK Ag Report - Special Tobacco Edition.

24.4 Check-Out Activities

a. Provide students with the following exercise:

1. List two reasons for cultivating tobacco.
2. How many times a year should tobacco be cultivated?
3. When should we stop cultivating tobacco?
4. How deep should tobacco be cultivated?

ANSWERS:

1. a. Control weeds
   b. Loosen surface soil to slow water run-off
2. As needed but usually no more than two or three times
3. When it will cause damage to the leaves
4. Shallow

b. Have students cultivate some tobacco and check them out against the latest recommendations of the University of Kentucky Agricultural Experiment Station.

25. CONTROLLING DISEASES IN THE TOBACCO FIELD

25.1 Performance Objective

Given a written check-out activity concerning controlling diseases in the tobacco field, students will complete the activity with 80 percent accuracy.

25.2 Teaching-Learning Activities

a. This section on controlling diseases in the tobacco field can best be taught using the problem-solving procedure. Prepare appropriate lessons for class use.

b. Obtain and display specimen labels of fungicides. Students may use these in determining control methods for various diseases. Obtain samples for demonstration purposes or develop and show a slide presentation of the various types of diseases affecting tobacco in the field. Have students learn to identify these diseases.

c. Invite an extension tobacco specialist to present a discussion on the diseases which commonly affect tobacco in the field and how they should be controlled. Should the tobacco field on the school grounds or school farm laboratory (if any) or a local tobacco producer's field become infected with disease(s), have students control the disease(s). Provide students with the necessary chemicals and application equipment. Check students' work for correct procedures.

25.2.1 Effects of diseases on tobacco crops.

a. Diseases continue to take a heavy toll of crop profits in the burley states. In 1975, it was estimated that the 17 most common diseases affecting tobacco cost growers $1,494,990.

b. Diseases cause serious damage to the tobacco crop at all stages of production--in the plantbed, in the newly transplanted field, during growth of the crop, and even when the crop is curing.

25.2.2 Planning disease control programs.

a. The first step of any disease control program is to recognize the disease. (See transparency master 25.2.2a.)

b. Disease-free transplants are necessary for a complete field disease control program.

c. Prevention is the best control for disease in the tobacco field. It is important to select a variety of tobacco that is resistant to most field diseases.

d. If disease hits a field, the diseased plants should be removed and burned.

25.3 Supplementary Materials

References: 1. Burley Tobacco Production . . . In Tennessee, Publication 358.

2. Controlling Black Shank of Tobacco in Kentucky, Cir. 607-A.

3. Tobacco Diseases, Cir. 522-A.

4. UK Ag Report - Special Tobacco Edition.

5. 1976 Virginia Weed-Disease Control Guide.

Transparency Master: 25.2.2a, "Major Diseases Affecting Burley Tobacco."

25.4 Check-Out Activities

1. If disease appears in the field, what should we do with the plants?

2. What is the best control for disease?

3. What disease is spread by machinery or water?

4. List three major diseases in tobacco.

ANSWERS:

1. Remove them and burn them.
2. Plant resistant plants.
3. Black shank.
4. a. Bacterial wilt
   b. Black root rot
   c. Black shank
   d. Blackfire
   e. Damping-off
   f. Etch
   g. Frogeye
   h. Fusarium wilt
   i. Hollow stalk
   j. Mosaic
   k. Pythium root rot
   l. Ring spot
   m. Root knot
   n. Sore shin
   o. Vein banding
   p. Wildfire

MAJOR DISEASES AFFECTING BURLEY TOBACCO

- BACTERIAL WILT
- BLACK ROOT ROT
- BLACK SHANK
- BLACKFIRE
- DAMPING-OFF
- ETCH
- FROGEYE
- FUSARIUM WILT
- HOLLOW STALK
- MOSAIC
- PYTHIUM ROOT ROT
- RING SPOT
- ROOT KNOT
- SORE SHIN
- VEIN BANDING
- WILDFIRE

26. TOPPING TOBACCO

26.1 Performance Objective

Given a written check-out activity concerning topping tobacco, students will complete the activity with 80 percent accuracy.

26.2 Teaching-Learning Activities

a. This section on topping tobacco can best be taught using the problem-solving procedure. Prepare appropriate lessons for class use.

b. Schedule a field trip to a sample farm or take students to the tobacco field on the school grounds or school farm laboratory when the tobacco field is in the bloom stage. If a student has tobacco in his/her experience program, you may wish to use their crop. Demonstrate to the students the correct procedures involved when topping tobacco.

c. Provide the students with the necessary cutting equipment and a tobacco field in the bloom stage. Have the students top the tobacco field. Compare student performance to the University of Kentucky Agricultural Experiment Station recommendations.

26.2.1 Benefits of topping tobacco.

The practice of topping increases yields and results in more uniform ripening of the plants.

26.2.2 Tobacco topping methods.

Topping is usually done when about half of the plants have at least one flower open showing a pink color. At this time, the tops are broken out so that the upper leaf that is left is eight to ten inches in length. In most years when the plants have grown evenly, all plants can be topped at one time. However, in other years when plant growth is uneven, two or more toppings will be needed.

26.3 Supplementary Materials

References: 1. Burley Tobacco--Transplanting to Harvest, Publication 293.

2. Topping and Suckering Burley Tobacco, Publication 373.

3. UK Ag Report - Special Tobacco Edition.

26.4 Check-Out Activities

1. What stage of bloom should tobacco be in before topping?

2. How much of the top should be broken out?

3. How many toppings are required in most years when the plants are even?

4. Give two reasons why plants should be topped.

ANSWERS:

1. When half the plants have at least one flower showing pink color.
2. Down to where the upper leaf is eight to ten inches in length.
3. One.
4. Increases yields and results in more uniform ripening of the plant.

27. CONTROLLING SUCKERS IN TOBACCO

27.1 Performance Objective

Given a written check-out activity concerning controlling suckers in tobacco, students will complete the activity with 80 percent accuracy.

27.2 Teaching-Learning Activities

a. This section on controlling suckers in tobacco can best be taught using the problem-solving procedure. Prepare appropriate lessons for class use.

b. Present a lecture to the class which outlines the need for sucker control and the methods used to suppress development. Include the use of the major sucker control chemicals on the market.

c. Obtain labels from containers of chemical sucker controls. Show these to the class and discuss the advantages and disadvantages of each brand.

d. Provide students with the necessary sucker control chemical and the necessary application equipment. Have the students control suckers in a tobacco field.

e. Use extension or chemical personnel as resource persons.

27.2.1 Tobacco sucker growth and control.

a. There are small buds, called suckers, at the point where each leaf is attached to the stalk. When tobacco plants are growing, hormones are produced in the small, rapidly growing bud leaves, which suppress enlargement of the sucker buds. Breaking out the top from a plant removes the source of the growth hormones and the suckers start to grow rapidly. Historically, the suckers had to be removed before harvesting the tobacco by breaking out each sucker by hand. During the 1950's, a synthetic growth hormone, maleic hydrazide (MH), that would suppress sucker growth was introduced to tobacco growers. The chemical could be sprayed on tobacco plants after topping and it prevented sucker growth with a great degree of success. Since then, other chemicals have been found that will also suppress sucker growth.

b. Suckers must be controlled on dark tobacco and can be done by hand suckering or by chemical treatment.

c. Most farmers use MH for controlling suckers. Several brands are available in Kentucky, ranging from 1.5 to three pounds of active material per gallon. The grower must be sure which formulation he is using in order to get the proper amount of active material onto the crop. The label should be carefully checked and the directions followed as given by the manufacturer.

d. The proper time to use MH is when at least half of the plants are in flower. The chemical may be applied before or after topping. All suckers should be removed when the plants are topped.

e. Experiment Station field tests with burley have shown that using higher than suggested rates of MH, or spraying more than once, did not improve sucker control or increase tobacco yields if the first application gave control. If the following precautions are observed, MH used at the suggested rate should provide adequate sucker control for three to four weeks.

   (1) Avoid excessive nitrogen fertilization. There is more pressure on tobacco plants to produce suckers when heavily fertilized with nitrogen, especially if soil moisture is high after topping.
   (2) MH is not absorbed as efficiently if tobacco leaves are wilted at time of spraying. You may need to irrigate or wait for rain before spraying, or spray before noon if soil moisture is low.
   (3) Remove all suckers one inch long or longer before spraying.
   (4) If the potassium salt of maleic hydrazide is used (1 1/2 or 2 1/4 pounds per gallon active ingredient), rain occurring within six hours after spraying may cause poor sucker control. If the diethanolamine salt material is used (three pounds per gallon active ingredient), rain within 12 hours may reduce effectiveness of the spray. Observe plants daily and if suckers remain green and continue to grow, respray, using the same amount used for the first spray.

f. Some growers may choose to use a contact type sucker control chemical which contains fatty alcohols, rather than using MH. Contact sucker control chemicals have not given as good sucker control on burley as MH. Contact chemicals are not absorbed by the plants. Instead they are applied to the upper leaves as a coarse spray so that the liquid will run down the stalk and make contact with each sucker bud.

g. The proper topping time when a contact chemical is used is when the plants are in the button stage, before any flowers are open. If power equipment is used, a three-nozzle arrangement with TG3 full cone tips or equivalent should be used and pressure should not exceed 25 psi. If a hand sprayer is used, direct a coarse spray toward the upper end of the stalk. To reduce leaf damage, keep the nozzles of either type of sprayer at least 12 inches above the upper leaves while spraying.

h. A contact type chemical can be applied immediately before or within two days after topping. Contact chemicals kill suckers quickly and if no rain occurs within an hour after spraying, sucker kill should be completed.

i. Growers are warned not to mix insecticides with contact sprays and not to apply a contact chemical to tobacco that has been sprayed with insecticide in the past 48 hours.

j. For dark air-cured and fire-cured tobacco, either MH or fatty alcohol sucker control materials can be used. Dark tobacco produces larger suckers than burley and usually is left in the field longer than burley between topping and harvesting. For these reasons, a larger amount of MH is required to control suckers.

k. Some farmers object to the yellowing of upper leaves caused by MH and prefer to use a contact chemical. The contact suckering agent also allows for fuller expansion of the upper leaves of dark tobacco than when MH is used.

27.3 Supplementary Materials

References:

1. Burley Tobacco -- Transplanting to Harvest, Publication 293.
2. Sucker Control Chemicals for Burley Tobacco, Publication 373.
3. Topping and Suckering Burley Tobacco, Publication 373.
4. UK Ag Report - Special Tobacco Edition.

27.4 Check-Out Activities

Provide students with the following exercise:

1. When should MH be applied to tobacco?
2. How much active ingredient should be applied using a systemic chemical?
3. How much water should be applied with chemical?
4. What is the reason for not applying when the temperature is above 90°F on a bright sunny day?
5. How long must the MH stay on before a rain?

ANSWERS:

1. When about half the plants are in bloom. It may be done before or after topping.
2. One pint per 1000 plants with diethanatamine salt or one and one-half pints per 1000 plants for potassium salts.
3. 20 or more gallons per acre
4. There is more chance of chemical burn
5. 8-12 hours

28. SELECTING AND PREPARING BARNS FOR CURING TOBACCO

28.1 Performance Objective

Given a written check-out activity concerning selecting and preparing barns for curing, students will complete the activity with 80 percent accuracy.

28.2 Teaching-Learning Activities

a. This section on selecting and preparing barns for curing tobacco can best be taught using the problem-solving procedure. Prepare appropriate lessons for class use.

b. Obtain copies of the tobacco curing barn blueprints from the reference, List of Plans for Tobacco Barns and Equipment, Publication AEN-5. Go over the blueprints with the students. Explain the construction procedures and advantages of newly constructed curing barns. Discuss the feasibility of remodeling older barns compared to the construction of new facilities.

c. Take a field trip to visit several styles and types of curing barns. Have the students observe the advantages and disadvantages in the construction of each barn. Have students list the improvements that should be made to each barn prior to housing tobacco.

d. If arrangements can be made with a tobacco producer in the community whose barn needs repairs before housing tobacco, or if there is a barn on the school grounds or school farm laboratory in which tobacco is to be housed and which needs repairs, provide the students with the necessary materials and tools to conduct the needed repairs. Supervise the work for accuracy.

28.2.1 Types of tobacco curing barns.

a. Several curing facilities have been developed in recent years which reduce the amount of labor required to house burley and dark air-cured tobaccos. Any producer who is considering improving or expanding his/her curing facilities should weigh all the options available in order to select one that best meets the needs.

Information and plans for the various facilities are available from the University of Kentucky Department of Agricultural Engineering.

b. Three-tier air-cure barn

Plans are available for conventional air-cure barns, three tiers high. They are easier to fill than the taller barns traditionally built for burley.

In addition to being lower, they offer other desirable features, such as wide drive-through areaways, full-width tracked doors, pole frame construction and clear-span, trussed-roof design. Several options are available as to barn width and tier rail spacing.

Smaller crew size (three people) and less total labor required to fill the barns justify the slightly higher construction cost per acre. Operation and management of the barns are essentially the same as for all conventional barns.

c. Two-tier forced air barn.

A two-tier forced-air curing barn plan is also available. It permits more compact housing of tobacco with labor-saving and modified environmental control features. Fans are used to force air through the tobacco, permitting closer spacing of the tobacco to give two tiers as much capacity as three and four tiers in a conventional barn.

It is even lower in height than the three-tier air-cure barn, allowing a crew of two to fill it with further reduction in total labor. The additional cost of the fans and supplemental heating equipment are offset by closer spacing of the tobacco. Fuel costs will vary depending on weather, crop and management and must be justified on the basis of labor saved and the benefits of environmental modification.

d. One-tier temporary structure.

The portable curing frame system features mechanical handling and housing of tobacco on special frames with tractor forklift equipment. The curing barn must be open-interior (clear-span) construction or have accessible driveways of sufficient width to accommodate the frames. A big advantage of the system is that it requires a smaller crew size than any other burley housing method (one or two people to load the frames in the field and one person housing with the tractor forklift). Overall labor reduction is approximately 40 percent in comparison to conventional housing methods.

More equipment is needed than other methods of handling and housing. Details of the system, equipment needed and options available are given in the USDA Agricultural Information Bulletin No. 366.

e. Open-interior air-cure barn.

A one-tier plastic-covered structure can be a low-cost temporary curing facility for emergency or short-term use. Curing results in the structures have been comparable to conventional barn curing over several years with only the top grades showing some discoloration.

Housing can be accomplished by one person directly from wagon or truck bed. The six-mil black plastic cover will last one or two seasons.

f. Partially enclosed barn.

A compromise between the low-cost plastic-covered temporary structure and a permanent, completely enclosed tobacco barn is a two-tier partially enclosed metal covered structure that can be enclosed at a later time. This approach allows lower initial cost, yet provides a permanent structure that can be enclosed and completed later into a high quality facility.

This section was taken from UK Ag Report - Special Tobacco Edition.

28.2.2 Managing the barn.

a. Locate the barn on an open, well-drained area with sides facing the direction of the prevailing winds for best ventilation. The best location is on a ridge, hill, or a high point in the field.

b. Provided that one side faces the prevailing winds, the structure's length and height will not noticeably affect air circulation within the barn. Width is the most important dimension affecting ventilation. Width determines (1) the distance the air must move as it passes through the barn and (2) the quantity of tobacco through which the air must pass.

c. A standard barn is 40 feet wide and 60 feet or more long with a sidewall 20 feet high and a gable roof of 1/3 pitch. The only ventilators are full-length sidewall vertical doors equivalent in area to at least 1/3 of the sides. Since larger tobacco now is being grown, some farmers are building barns with rails up to six feet apart vertically.

d. When repairing old barns or building new ones, provide ample ventilators on the sides. In barns 36 to 40 feet wide, hinge at least 1/3 of the boxing or siding to permit opening and closing. Wider barns need even more ventilation.

e. Ventilators are not needed at the ends of burley barns unless prevailing winds strike the end of the barn and tier rails run parallel with the width. If prevailing winds strike the side of the barn and tier rails are parallel to width, the barn should be remodeled and tier rails changed to run parallel to the length of the barn and ventilators should be provided on the sides. Research at the Kentucky Agricultural Experiment Station has shown that ventilators in the roof are almost useless.

f. Because of reduced acreages, the smaller 32-foot wide pole type barns are becoming popular and practical. Plans for these lower cost barns are available from your county Extension agent.

This section was taken from Harvesting and Curing Burley Tobacco.

28.3 Supplementary Materials

References:

1. Burley Mechanization, Misc. Pub. 393.
2. Curing Bright Tobacco in Bulk Barns, Publication 459.
3. Harvesting and Curing Burley Tobacco, AGR-14.
4. List of Plans for Tobacco Barns and Equipment, AEN-5.
5. UK Ag Report - Special Tobacco Edition.

Other: Blueprints of tobacco curing barns.

28.4 Check-Out Activities

Provide students with the following exercise:

1. Give two advantages for the three-tier air-cure barn.
2. Give two advantages for the two-tier forced air barn.
3. Give an important disadvantage of the two-tier forced air barn and explain why this may become even more important in the future.
4. Give two advantages of an open-interior air-cure barn.
5. Give two advantages of a partially enclosed barn.

ANSWERS:

1. a. Easier to fill than traditional barns (lower)
   b. Wide drive-through areaways
   c. Full-width tracked doors
   d. Pole frame construction and clear span
   e. Smaller crew size (three) and less total labor

2. a. Even lower in height
   b. Two-person crew
   c. Less total labor
   d. Fits more tobacco in less space
   e. Allows better control of the environment
3. It uses more energy to operate the fans and heating equipment. As energy prices go up and many fuels become less available, this system will become more expensive and less desirable.
4. a. Smaller crew size
   b. Labor reduction of 40 percent over conventional housing
5. a. Lower original cost
   b. Provides a permanent structure

29. DROPPING STICKS AND CUTTING TOBACCO

29.1 Performance Objective

a. Given a written check-out activity concerning dropping sticks and cutting tobacco, students will complete the activity with 80 percent accuracy.

b. Given a field of tobacco at the harvesting stage and the necessary harvesting equipment, the student will drop, cut, spear, and space plants on a stick. The sticks will be dropped at the correct interval. The plants will be cut at the correct height, speared properly and spaced on a tobacco stick in accordance with the latest recommendations of the University of Kentucky Agricultural Experiment Station.

29.2 Teaching-Learning Activities

a. This section on dropping sticks and cutting tobacco can best be taught using the problem-solving procedure. Prepare appropriate lessons for class use.

b. Develop and show slide presentation showing different methods of dropping sticks. Include use of "high boy sprayer" to drop sticks and use of "high school" students to drop sticks making sure to count three plants in one row each time student drops one stick.

c. Develop and show a slide presentation showing a tobacco producer using the proper techniques in cutting, spearing and spacing tobacco on a stick. Show the slides in a step-by-step sequence from the time the plant is cut until it is spaced on the stick. Explain each step as it is shown.

d. Take a field trip to a tobacco producer's farm in the community to observe an experienced tobacco cutter cutting, spearing, and spacing tobacco on a stick. Provide the students with the opportunity to ask questions concerning the proper techniques involved.

e. Provide students with the necessary cutting and spearing equipment and have them cut, spear, and space tobacco on a stick. (The field of tobacco cut could be a student's or a field of tobacco on the school grounds or farm.)

f. Show students the transparency made from transparency master 29.2a, "Production and Harvesting Cost Per Acre for Alternative Harvesting Systems." Discuss with the class various types of harvesting systems other than the conventional method.

29.2.1 Cutting tobacco at the proper time.

a. Ripening does much to improve the quality of burley tobacco. Cut tobacco when nearly all the upper leaves show a distinct yellow tinge. The added growth and improved quality of ripe tobacco more than make up for the loss of lower leaves. In very humid harvest seasons, cutting when the middle leaves show a distinct yellow tinge may be desirable.

b. Leave the tobacco in the field in the standing stick long enough for it to wilt (your housing facilities will partly govern the length of time) but never longer than 3 to 5 days. Loss in fresh weight will be about 20 percent by the end of five days with little or no loss in value. Fully matured tobacco is not likely to sunburn; however, green tobacco often sunburns. Sunburned tobacco should be left standing in the field for about three days to reduce damage.

This section is taken from Harvesting and Curing Burley Tobacco.

29.2.2 Effective cutting techniques.

a. Good cutting techniques are important for saving time and labor. An inexperienced cutter should observe closely and practice the techniques used by more experienced cutters. Good cutters have been known to cut as many as 1,200 sticks per day.

b. Especially important techniques for fast cutting are proper feet placement and swinging the stalk from the cutting position onto the spear in one curved motion.

c. Spearing the stalk to place it on the stick is faster than the older method of splitting it. Use of a sharp cutting knife and a high quality steel spear with a needle point is essential. There will be better control of the spear if it is used on sticks sharpened like a pencil. Sticks should be sharpened on both ends so one end can be stuck in the ground securely. Five or six plants per stick is recommended.

d. Cutting in the afternoon and housing the following morning lessens the chance of damage from sunburn and the breaking off of leaves. Tobacco should not be left in the field more than three to five days.

29.3 Supplementary Materials

References:
1. Considering a Mechanical Tobacco Harvestor or Bulk Barn, Ag Economics Notes.
2. Harvesting and Curing Burley Tobacco, AGR-14.
3. UK Ag Report - Special Tobacco Edition.

Other: Slide presentation - "Step-by-Step Techniques Involved in Cutting, Spearing and Spacing Tobacco on a Stick," (Self Developed).

Transparency Master: 29.2a, "Production Harvesting Cost Per Acre for Alternative Harvesting Systems."

29.4 Check-Out Activities

a. Provide students with the following exercise:

1. Good cutting techniques are important for saving time and labor. T F

2. Good cutters have been known to cut as many as 1200 sticks per day. T F

3. Splitting the stalk saves time and is a better method than spearing the stalk. T F

4. The spear will be better controlled if placed on a flat stick. T F

5. It is recommended that you put 10-12 plants on a stick. T F

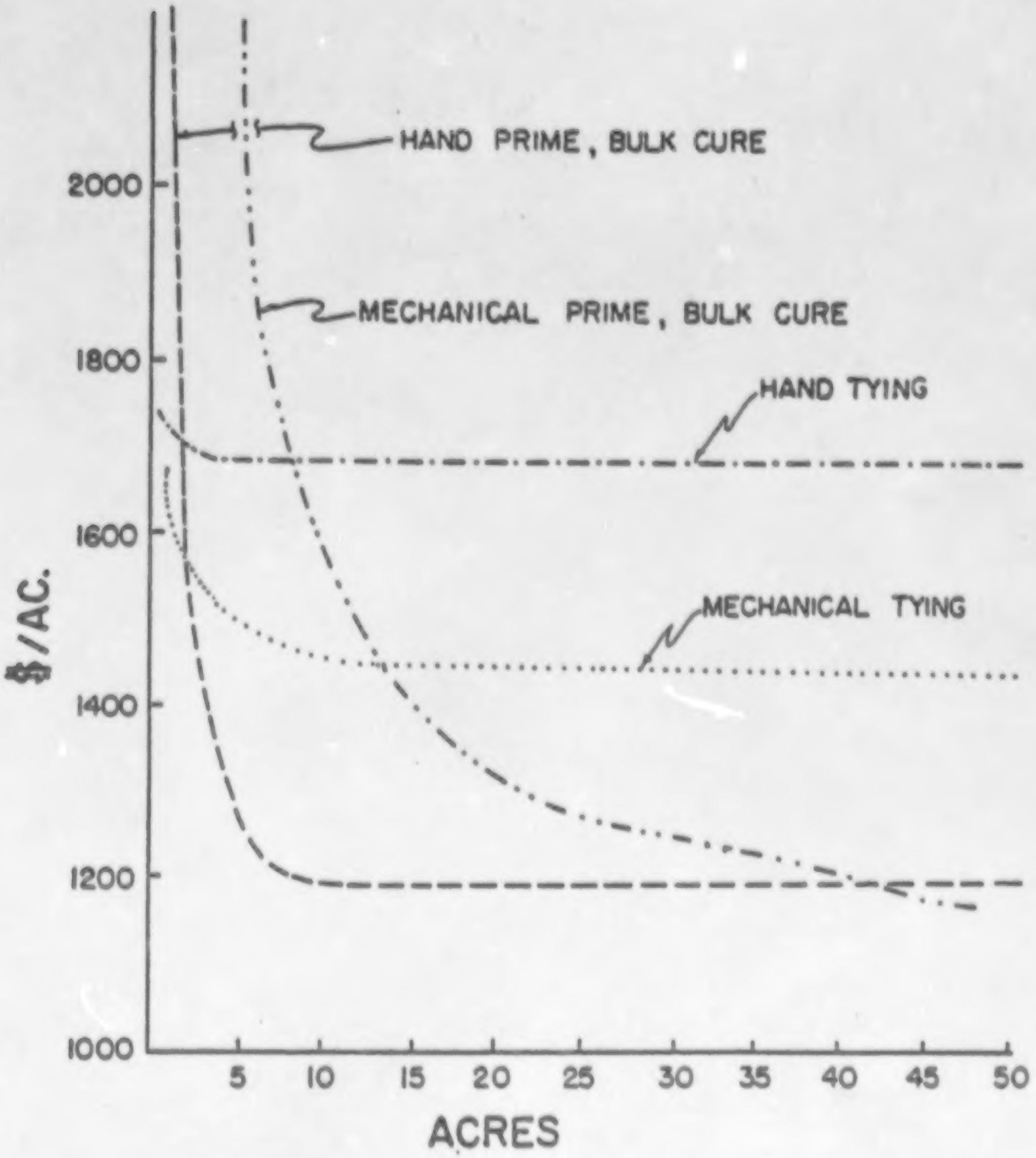
6. The size of plants will determine the number of plants we place on a stick. T F

ANSWERS:

1. True
2. True
3. False
4. False
5. False
6. True

b. Have students cut tobacco, demonstrating each skill listed in the performance objective and meeting the latest recommendations of the University of Kentucky Agricultural Experiment Station.

PRODUCTION AND HARVESTING COST PER ACRE FOR ALTERNATIVE HARVESTING SYSTEMS



Source: Considering a Mechanical Tobacco Harvestor or Bulk Barn, Virginia Polytechnic Institute.

30. HAULING AND HOUSING TOBACCO IN THE BARN

30.1 Performance Objective

a. Given a written check-out activity concerning hauling and housing tobacco in the barn, students will complete the activity with 80 percent accuracy.

b. Given tobacco that has been cut and placed on a stick, tobacco transporting implements and a standard tobacco barn, the student will house tobacco. The sticks of tobacco will be carefully hauled to the barn, tiers will be filled from top to bottom and the sticks will be spaced 6 to 8 inches apart on the tiers and according to the latest recommendations of the University of Kentucky Agricultural Experiment Station.

30.2 Teaching-Learning Activities

a. This section on hauling and housing tobacco in the barn can best be taught using the problem-solving procedure. Prepare appropriate lessons for class use.

b. Use extension personnel as resource persons to discuss new harvesting methods.

c. Make and use transparencies and/or handouts from transparency masters at the end of this section.

d. Take a field trip to watch an experienced crew of men as they cut tobacco from the field and house it in the curing barn.

e. Divide the class(es) into housing crews. Provide them with the opportunity to transport tobacco from the field and house the crop in the curing barn. (Many tobacco producers would be very cooperative in allowing the students to perform this task on their burley crop.) Supervise the task for efficiency, correctness, and safety.

30.2.1 Handling tobacco during harvesting and housing.

a. Tobacco should be handled carefully from the time it is cut until it is in the barn. Any bruising or breaking of the leaves causes a lower quality tobacco crop to be marketed on the sales floor. This detracts from the appearance of the tobacco and lowers the price received.

b. After the tobacco has wilted properly and housing has begun, the barn should be filled as quickly as possible. This practice tends to promote uniformity in curing.

c. Good housing practices are essential to control the curing of burley tobacco. Many crops that come from the field in fine condition are seriously damaged by poor housing facilities.

d. Each bent should be filled completely from top to bottom as the crop is put in the barn. Leave enough space under the lowest rails so you can use heat if necessary. Starting the fill on the southwest side of the barn takes advantage of air movements in the early stages of curing. Space sticks about 6 to 8 inches apart on rails and spread the stalks on sticks. Make sure that the leaves are hanging down and not doubled up. Also, tip leaves should fall between lower sticks. Never hang fresh-cut tobacco (tobacco harvested earlier) under partially cured tobacco. Water evaporating from the fresh tobacco may cause partly cured tobacco to darken.

e. If you do not have enough tobacco to fill your barn, space it throughout the barn so air can circulate evenly through the tobacco.

f. For curing in August and September, the sticks are placed 12 to 14 inches apart on the tiers. In housing in late September, it is advisable to place the sticks eight to 10 inches apart.

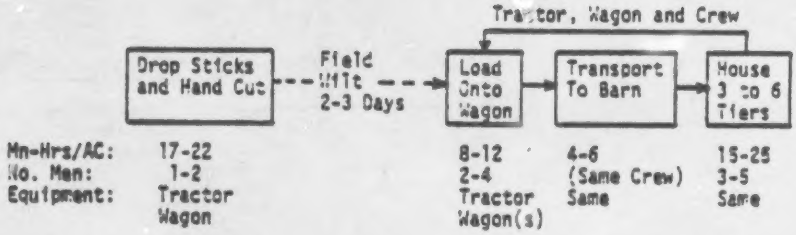
g. Very large tobacco may be housed by alternate hanging of the sticks so that the top leaves hang freely between the butts on the lower tier. It is also a good practice when housing to space the plants uniformly on the sticks and shake out any folded or matted leaves, promoting free circulation of air and lessening the danger of houseburn. It is also helpful to leave a few places in the barn where one can climb up in the tobacco and inspect it frequently.

30.2.2 Block diagrams showing how certain new harvesting and housing methods may work together.

The following block diagrams illustrate how certain harvesting and housing methods may work together in an efficient and functional manner. Certain handling procedures involving the harvester have been evaluated on the Agricultural Experiment Station Farm since the 1971 season.

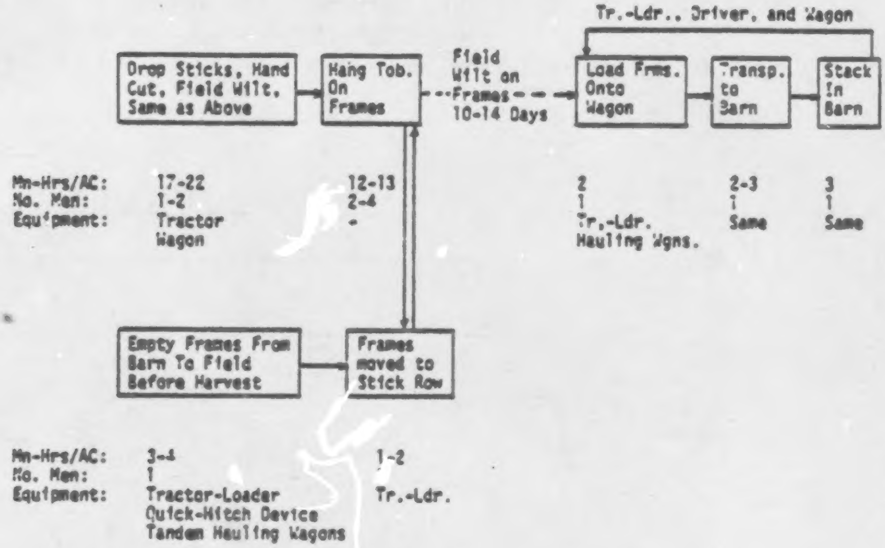
a. Hand Cut and Conventional Barns: (See transparency master 30.2.2a.)

The first diagram illustrates the conventional system. It is shown as an introduction to the block diagram procedure and a comparison for all other arrangements.


Tractor, Wagon and Crew
Drop Sticks and Hand Cut
Field Wilt 2-3 Days
Load Onto Wagon
Transport To Barn
House 3 to 6 Tiers
Mn-Hrs/AC:
No. Men:
Equipment:
17-22
1-2
Tractor
Wagon
8-12
2-4
Tractor
Wagon(s)
4-6
(Same Crew)
Same
15-25
3-5
Same

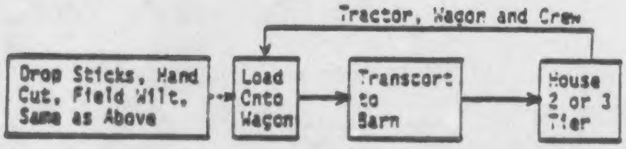
b. Hand Cut, Portable Frames, and Open-interior Barn: (See transparency master 30.2.2b.)

This arrangement shows portable frames used in the manner tested and developed through several years of research, development, and on-farm evaluation.


Tr.-Ldr., Driver, and Wagon
Drop Sticks, Hand Cut, Field Wilt, Same as Above
Hang Tob. On Frames
Field Wilt on Frames 10-14 Days
Load Frms. Onto Wagon
Transp. to Barn
Stack In Barn
Mn-Hrs/AC:
No. Men:
Equipment:
17-22
1-2
Tractor
Wagon
12-13
2-4
-
2
1
Tr.-Ldr.
Hauling Wgns.
2-3
1
Same
3
1
Same
Empty Frames From Barn To Field Before Harvest
Frames moved to Stick Row
Mn-Hrs/AC:
No. Men:
Equipment:
3-4
1
Tractor-Loader
Quick-Hitch Device
Tandem Hauling Wagons
1-2
Tr.-Ldr.

c. Hand Cut and Two- or Three-tier Barn (Air-cure or Forced-air): (See transparency master 30.2.2c.)

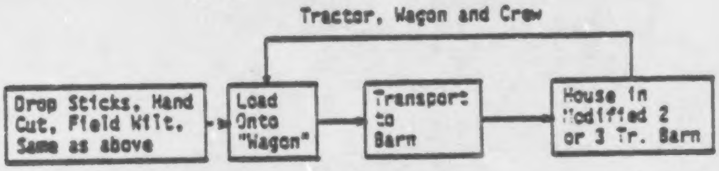
By using fewer vertical tiers and spacing them farther apart, at least one worker can be eliminated in the barn and the efficiency of the others increased. This will reduce the man-hours of housing labor by 30 to 50 percent. By modifying the barn to a three-tier arrangement, 5 feet apart vertically, many producers could realize this potential labor reduction.


Tractor, Wagon and Crew
Drop Sticks, Hand Cut, Field Wilt, Same as Above
Load Onto Wagon
Transport to Barn
House 2 or 3 Tier

Mn-Hrs/AC:	17-22	8-12	4-6	10-12 in 2-tier 14-18 in 3-tier
No. Men:	1-2	2-3	(Housing Crew)	2-3
Equipment:	Tractor Wagon	Tractor Wagon(s)	Same Same	Same Same

d. Hand Cut, New Slant-stick Wagon, and Two- or Three-tier Barn: (See transparency master 30.2.2d.)

The new slant-stick wagon design has the potential for eliminating another worker in the barn with certain barn modifications. Even though this particular wagon design has not been field-tested, a producer-innovator in Central Kentucky built a conveyor device with this slant-stick principle two years ago and has used it successfully since then.


Tractor, Wagon and Crew
Drop Sticks, Hand Cut, Field Wilt, Same as above
Load Onto "Wagon"
Transport to Barn
House in Modified 2 or 3 Tr. Barn

Mn-Hrs/AC:	17-22	8-10	4-6	8-10 in 2 Tr. 10-12 in 3 Tr.
N. Men:	1-2	2-3	(Housing Crew)	1-2
Equipment:	Tractor Wagon	Tractor New Wagon	Same	Same

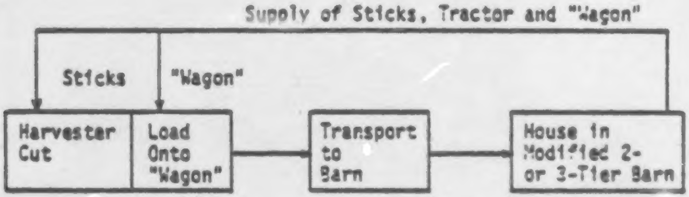
e. Harvester, New Slant-stick Wagon, and Two- or Three-tier Barn: (See transparency master 30.2.2e.)

This block diagram illustrates a proposed arrangement first tested in 1971, using the harvester, new slant-stick wagon, and the two- or three-tier barn. The wagon is designed to allow one man to load it behind the harvester. To avoid fatigue during prolonged operation, he may need to exchange jobs with co-workers. Data shown are based on anticipated harvester performance and housing data adapted from related studies. Freshly cut, immediately housed tobacco will require full barn ventilation and/or supplemental heat for good curing in absence of normal field wilting.

The new slant-stick wagon is expected to hold 140 to 160 sticks of freshly cut tobacco. Since the harvester places five plants on each stick, rows should contain 240 to 260, 350 to 400, or

700 to 800 plants per row. Using these row lengths, the wagon can be filled by either one, two, or three rows of tobacco and conveniently unhitched at a row end rather than in the middle of the field.

This handling arrangement is considered to be the least costly and most efficient method of transporting freshly cut tobacco from the harvester to a barn. Any producer considering the purchase of a harvester could use this arrangement after making certain barn modifications and using two wagons per harvester.


Supply of Sticks, Tractor and "Wagon"
Sticks
"Wagon"
Harvester Cut
Load Onto "Wagon"
Transport to Barn
House in Modified 2- or 3-Tier Barn

Mn-Hrs/AC:	16-20	8-10	4-6	8-10 in 2 tr., 10-12 in 3 tr.
No. Men:	2	1	(Housing Crew)	2 (maybe 4)
Equipment:	Tractor Harvester	New "Wagon"	2nd Tractor 2nd "Wagon"	Same Same

f. Harvester, Portable Frames, and Open-interior Barn: (See transparency master 30.2.2f and 30.2.2g.)

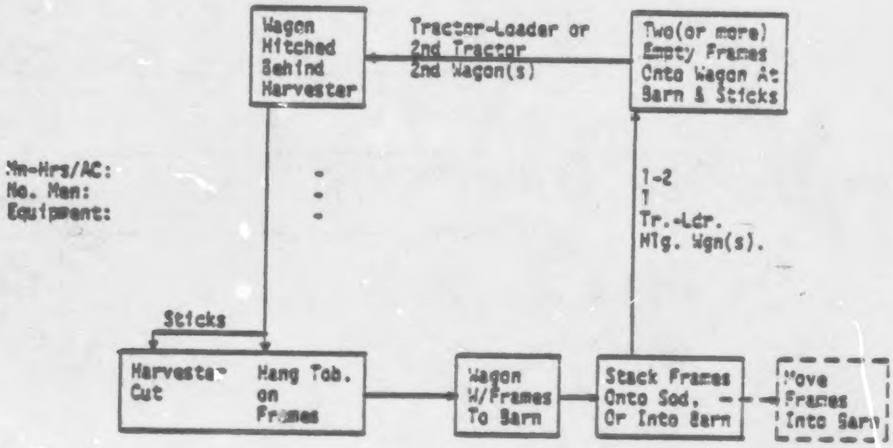
The combination of portable frames and harvester has long been envisioned as a real "mechanized" system for stalk-cut stick-speared burley tobacco. However, some difficulties will be experienced in shuttling frames to and from the harvester if done at random positions throughout the field as frames are filled. Also, barn renovations and equipment changes are necessary and prior planning is vital. Shown below are two possibilities. Thorough consideration should be given to proper equipment and scheduling of transport and other operations.

In System A, empty frames are stored at the barn and hauled directly to the harvester on a wagon which will haul two 4'-8" frames side-by-side in a stable manner. After filling, the wagon is returned to the barn where the frames are unloaded.

In System B, frames are taken to the edge of the field prior to harvest where they can be more easily shuttled to the harvester on the wide-bed wagon. Both methods require at least two men loading the frames behind the harvester. Both hanging and stalk spreading must be done since this is the last time the sticks will be manually handled until after curing.

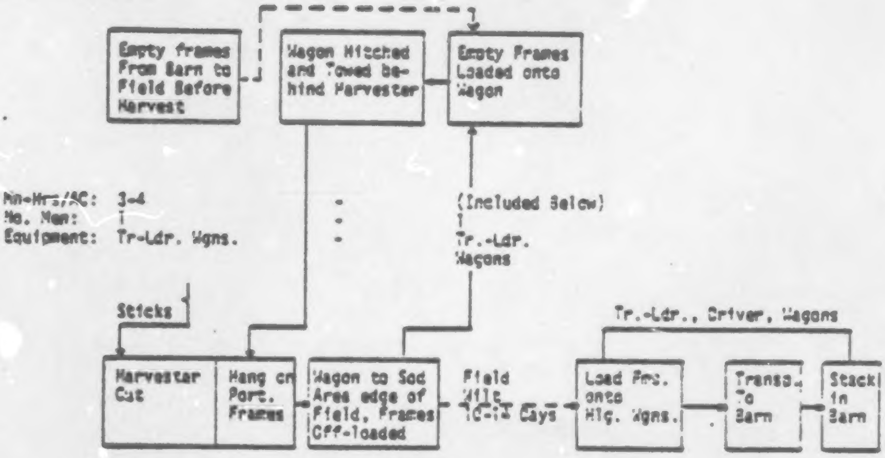
The harvester will need an empty frame every 30 to 34 sticks (14-foot frame, 5 plants per stick) or 150 to 170 plants. To avoid hitching and unhitching wagons in the middle of the field, have approximately 300 to 400 plants in each row. This permits changing wagons at row ends. Changing frames or wagons at random locations throughout the field may cause an excessive amount of wagon travel, difficulty in switching wagons to the harvester, and probable waste of harvester time.

System A:


Wagon Hitched Behind Harvester
Tractor-Loader or 2nd Tractor 2nd Wagon(s)
Two(or more) Empty Frames Onto Wagon At Barn & Sticks
Mn-Hrs/AC: -
No. Men: -
Equipment: -
1-2
1
Tr.-Ldr.
Hlg. Wgn(s).
Sticks
Harvester Cut
Hang Tob. on Frames
Wagon W/Frames To Barn
Stack Frames Onto Sod, Or Into Barn
Move Frames Into Barn

Mn-Hrs/AC:	16-20	16-20	2-3	3	3-4
No. Men:	2	2	1	1	1
Equipment:	Tractor Harvester	Frames and Transport Wagon	2nd Tr.	Tr.-Ldr. Hlg. Wgn.	Tr.-Ldr.

System B:


Empty frames From Barn to Field Before Harvest
Wagon Hitched and Towed behind Harvester
Empty Frames Loaded onto Wagon
Mn-Hrs/AC: 3-4
No. Men: 1
Equipment: Tr-Ldr. Wgns.
-
-
-
(Included Below)
1
Tr.-Ldr.
Wagons
Sticks
Tr.-Ldr., Driver, Wagons
Harvester Cut
Hang on Port. Frames
Wagon to Sod Area edge of Field, Frames Off-loaded
Field Wilt 10-14 Days
Load Fms. onto Hlg. Wgns.
Transp. To Barn
Stack in Barn

Mn-Hrs/AC:	16-20	16-20	3-10	2	2-3	3
No. Men:	2	2	1	1	1	1
Equipment:	Tr. Harv.	Frames Wagon	Tr.-Ldr. Wagon	Tr.-Ldr. Hauling Wgns.	Same Same	Same Same

NOTES:

1. All travel distances for above arrangements are assumed to be 1/4 mile from field to barn. The assumed average travel speed is 3 miles per hour so that a round-trip is made approximately every 10 to 12 minutes. The number of trips depends on wagon capacity per load. Man-hours of labor are calculated from total travel time. Unless otherwise noted, the housing crew is not busy during travel.

2. All labor data represent the performance of a worker or crew working at a normal steady pace during time-motion studies. Total work time for a sustained schedule (half-day or longer) should probably be increased 25 to 50 percent to account for inefficiency of some workers, water and rest breaks, idle time, equipment problems, and other lost time.

This section and drawings adapted from Burley Mechanization.

30.3 Supplementary Materials

References: 1. Burley Mechanization, Misc. Publication 393.

2. Harvesting and Curing Burley Tobacco, AGR-14.

3. UK Ag Report - Special Tobacco Edition.

Transparency Masters: 1. 30.2.2a, "Hand Cut and Conventional Barns."

2. 30.2.2b, "Hand Cut, Portable Frames, and Open-Interior Barn."

3. 30.2.2c, "Hand Cut and Two- or Three-Tier Barn (Air-cure or Forced-air)."

4. 30.2.2d, "Hand Cut, New Slant-Stick Wagon, and Two- or Three-Tier Barn."

5. 30.2.2e, "Harvester, New Slant-Stick Wagon, and Two- or Three-Tier Barn."

6. 30.2.2f, "Harvester, Portable Frames, and Open-Interior Barn - System A."

7. 30.2.2g, "Harvester, Portable Frames, and Open-Interior Barn - System B."

30.4 Check-Out Activities

a. Provide students with the following exercise:

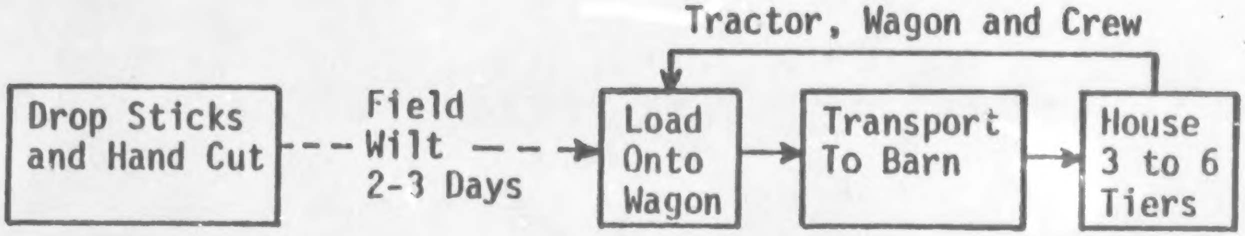
1. It is best to haul tobacco to the barn as soon as it is cut to prevent it from getting wet if it rains. T F
2. Tiers should be filled from top to bottom. T F
3. Sticks should be spaced at least 12 inches apart on the tiers. T F
4. It is best to hang the first stick you get on the rail on which you are standing as this rail tends to get out of reach as you move. T F
5. Rough handling can damage leaves and reduce the price received. T F

ANSWERS:

1. False
2. True
3. False
4. True
5. True

b. Have students house tobacco and evaluate them according to the latest recommendations of the University of Kentucky Agricultural Experiment Station.

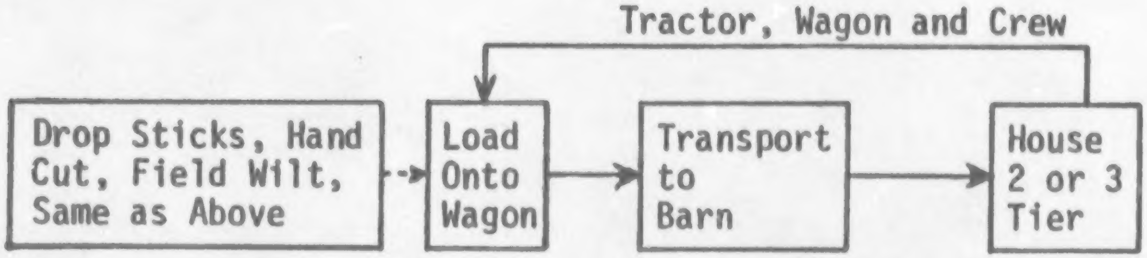
HAND CUT AND CONVENTIONAL BARNS


Tractor, Wagon and Crew
Drop Sticks and Hand Cut
Field Wilt 2-3 Days
Load Onto Wagon
Transport To Barn
House 3 to 6 Tiers

Mn-Hrs/AC:	17-22	8-12	4-6	15-25
No. Men:	1-2	2-4	(Same Crew)	3-5
Equipment:	Tractor Wagon	Tractor Wagon(s)	Same	Same

Source: Burley Mechanization.

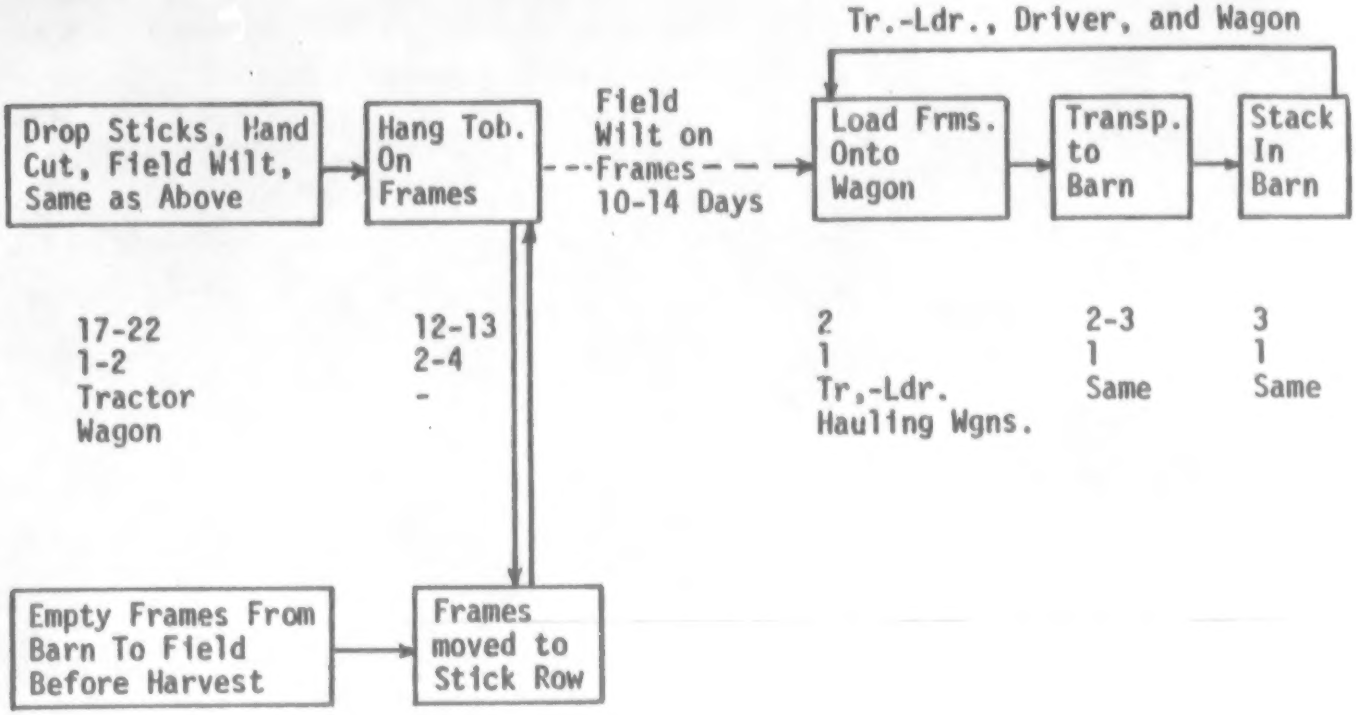
HAND CUT, PORTABLE FRAMES, AND OPEN-INTERIOR BARN


Tractor, Wagon and Crew
Drop Sticks, Hand Cut, Field Wilt, Same as Above
Load Onto Wagon
Transport to Barn
House 2 or 3 Tier

Mn-Hrs/AC:	17-22	8-12	4-6	10-12 in 2-tier 14-18 in 3-tier
No. Men:	1-2	2-3	(Housing Crew)	2-3
Equipment:	Tractor Wagon	Tractor Wagon(s)	Same Same	Same Same

Source: Burley Mechanization.

HAND CUT AND TWO- OR THREE-TIER BARN (AIR-CURE OR FORCED AIR)

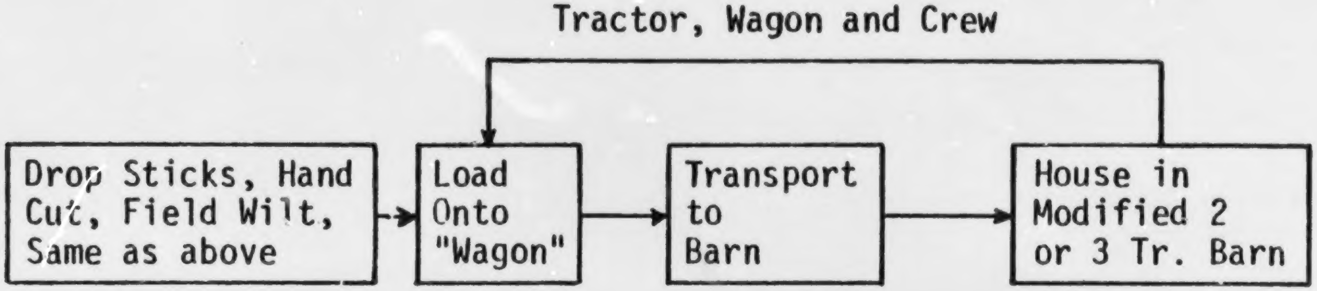

Tr.-Ldr., Driver, and Wagon
Drop Sticks, Hand Cut, Field Wilt, Same as Above
Hang Tob. On Frames
Field Wilt on Frames 10-14 Days
Load Frms. Onto Wagon
Transp. to Barn
Stack In Barn
Empty Frames From Barn To Field Before Harvest
Frames moved to Stick Row

Mn-Hrs/AC:	17-22	12-13	2	2-3	3
No. Men:	1-2	2-4	1	1	1
Equipment:	Tractor Wagon	-	Tr.-Ldr. Hauling Wgns.	Same	Same

Mn-Hrs/AC:	3-4	1-2
No. Men:	1	1
Equipment:	Tractor-Loader Quick-Hitch Device Tandem Hauling Wagons	Tr.-Ldr.

Source: Burley Mechanization.

HAND CUT, NEW SLANT-STICK WAGON, AND TWO- OR THREE-TIER BARN

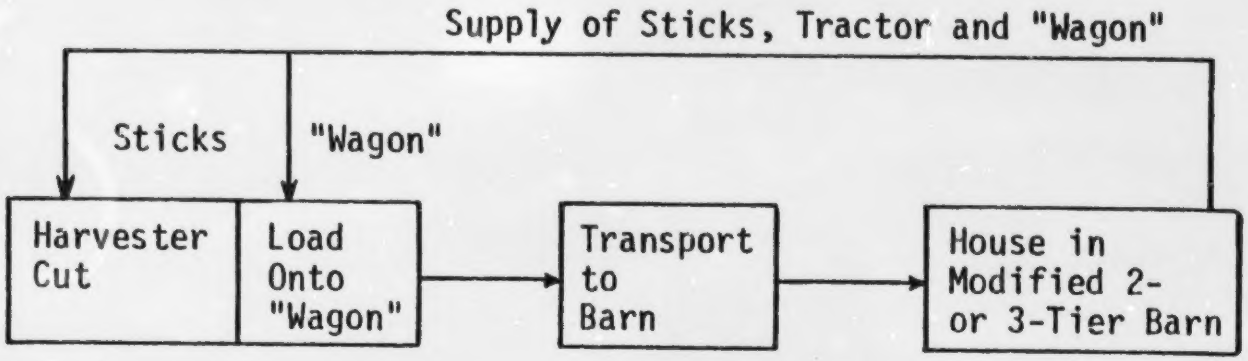

Tractor, Wagon and Crew
Drop Sticks, Hand Cut, Field Wilt, Same as above
Load Onto "Wagon"
Transport to Barn
House in Modified 2 or 3 Tr. Barn

Mn-Hrs/AC:	17-22	8-10	4-6	8-10 in 2 Tr, 10-12 in 3 Tr.
N. Men:	1-2	2-3	(Housing Crew)	1-2
Equipment:	Tractor Wagon	Tractor New Wagon	Same	Same

TM 30.2.2d

Source: Burley Mechanization.

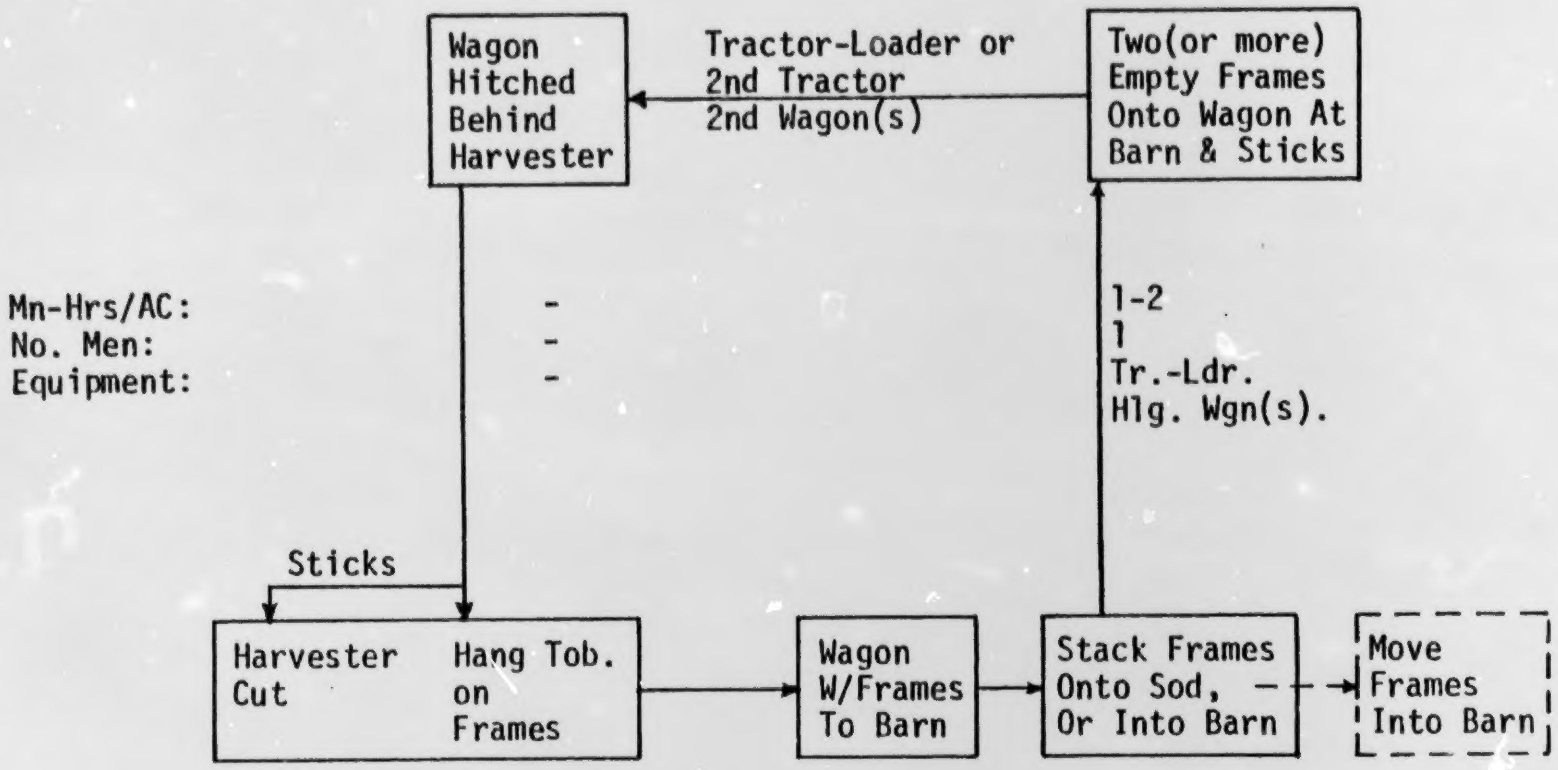
HARVESTER, NEW SLANT-STICK WAGON, AND TWO- OR THREE-TIER BARN


Supply of Sticks, Tractor and "Wagon"
Sticks
"Wagon"
Harvester Cut
Load Onto "Wagon"
Transport to Barn
House in Modified 2- or 3-Tier Barn

Mn-Hrs/AC:	16-20	8-10	4-6	8-10 in 2 tr., 10-12 in 3 tr.
No. Men:	2	1	(Housing Crew)	2 (maybe 4)
Equipment:	Tractor Harvester	New "Wagon"	2nd Tractor 2nd "Wagon"	Same Same

Source: Burley Mechanization.

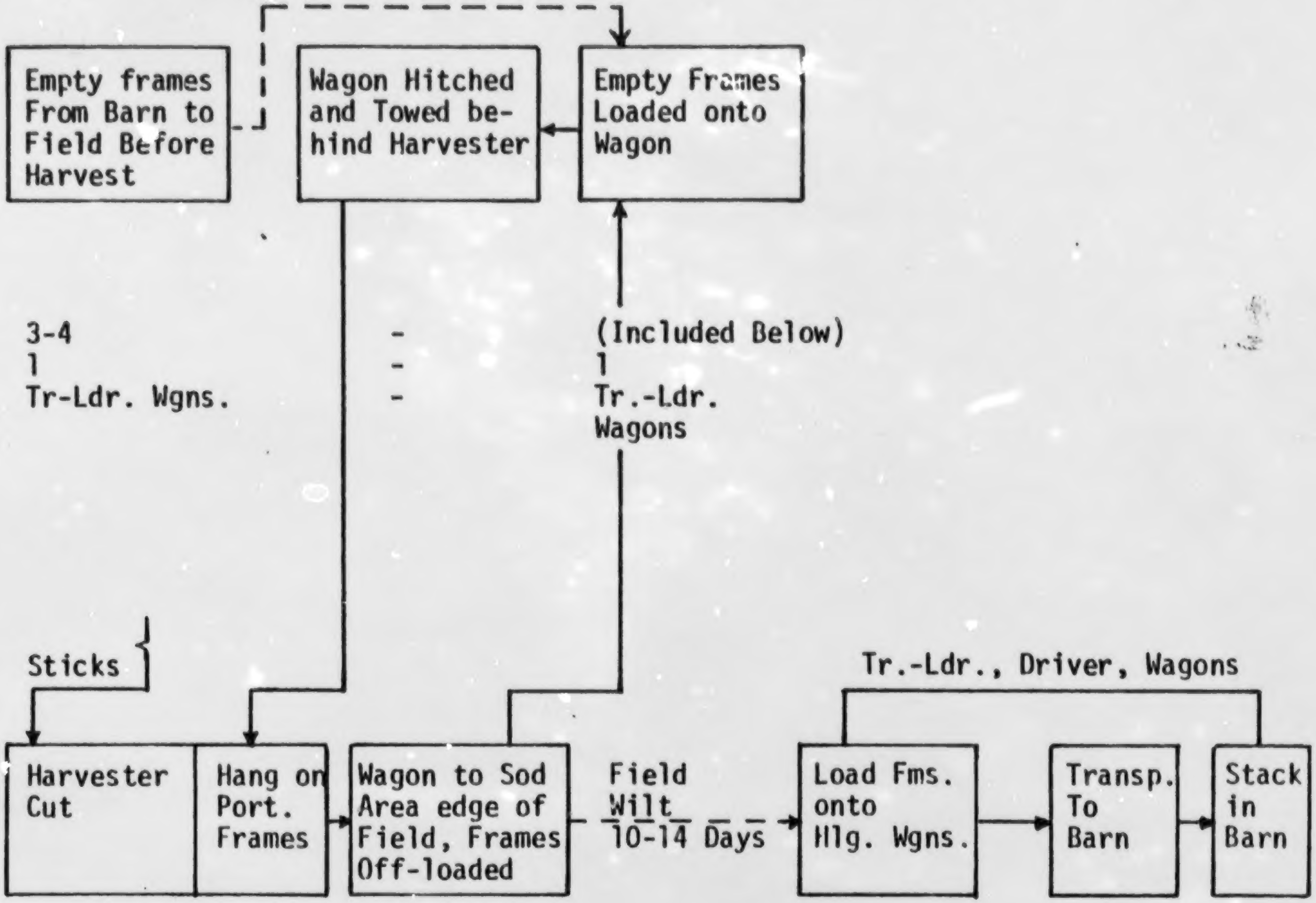
HARVESTER, PORTABLE FRAMES, AND OPEN-INTERIOR BARN - SYSTEM A


Wagon Hitched Behind Harvester
Tractor-Loader or 2nd Tractor 2nd Wagon(s)
Two(or more) Empty Frames Onto Wagon At Barn & Sticks
Mn-Hrs/AC: -
No. Men: -
Equipment: -
1-2
1
Tr.-Ldr.
Hlg. Wgn(s).
Sticks
Harvester Cut
Hang Tob. on Frames
Wagon W/Frames To Barn
Stack Frames Onto Sod, Or Into Barn
Move Frames Into Barn

Mn-Hrs/AC:	16-20	16-20	2-3	3	3-4
No. Men:	2	2	1	1	1
Equipment:	Tractor Harvester	Frames and Transport Wagon	2nd Tr.	Tr.-Ldr. Hlg. Wgn.	Tr.-Ldr.

Source: Burley Mechanization.

HARVESTER, PORTABLE FRAMES, AND OP[illegible]TERIOR BARN - SYSTEM B


Empty frames From Barn to Field Before Harvest
Wagon Hitched and Towed behind Harvester
Empty Frames Loaded onto Wagon
Sticks
Harvester Cut
Hang on Port. Frames
Wagon to Sod Area edge of Field, Frames Off-loaded
Field Wilt 10-14 Days
Tr.-Ldr., Driver, Wagons
Load Fms. onto Hlg. Wgns.
Transp. To Barn
Stack in Barn

	Empty frames From Barn to Field Before Harvest	Wagon Hitched and Towed behind Harvester	Empty Frames Loaded onto Wagon
Mn-Hrs/AC:	3-4	-	(Included Below)
No. Men:	1	-	1
Equipment:	Tr-Ldr. Wgns.	-	Tr.-Ldr. Wagons

	Harvester Cut	Hang on Port. Frames	Wagon to Sod Area edge of Field, Frames Off-loaded	Load Fms. onto Hlg. Wgns.	Transp. To Barn	Stack in Barn
Mn-Hrs/AC:	16-20	16-20	8-10	2	2-3	3
No. Men:	2	2	1	1	1	1
Equipment:	Tr. Harv.	Frames Wagon	Tr.-Ldr. Wagon	Tr.-Ldr. Hauling Wgns.	Same Same	Same Same

Source: Burley Mechanization.

31. CURING TOBACCO WITH AIR

31.1 Performance Objective

a. Given a written check-out activity concerning curing tobacco with air, students will complete the activity with 80 percent accuracy.

b. Given a tobacco barn with ventilators, tobacco housed in the barn, and fans, the student will cure tobacco using air according to the latest recommendations of the University of Kentucky Agricultural Experiment Station.

31.2 Teaching-Learning Activities

a. This section on curing tobacco with air can best be taught using the problem-solving procedure. Prepare the appropriate lessons for class use.

b. Use extension personnel as resource persons to present up-to-date information on curing tobacco with air.

c. Use school barn, a student's home barn, or arrange with a local tobacco producer to allow the students to assist in air curing a tobacco crop. Divide the students into small groups of two or three each and assign them the daily task of opening and closing ventilators, using fans and checking the curing conditions. Have each group be responsible for a particular day of the week. Supervise each group to see that the job is carried out properly.

31.2.1 Curing process.

The curing of tobacco is a natural process during which respiration takes place in the plant as it uses up accumulated food reserves. Curing of the tobacco occurs when temperature, humidity, and air supply bring about desirable changes in the chemical composition of the leaf. During the curing process the color and quality characteristics of the cured leaf develops.

31.2.2 Managing the barn.

a. The final quality of cured tobacco is determined largely by moisture conditions which prevail inside the tobacco barn during the curing period. High moisture causes tobacco to cure too slowly, producing red or house-burned leaf and heavy losses in weight. When tobacco stays in "brittle case," it cures too fast, causing a greenish-tinged, mottled, or pie-bald leaf.

b. Moisture can be controlled in burley barns fairly well through proper use of ventilators, plus careful use of heat in humid weather. Burley cures favorably when the temperature inside the barn ranges between 60° and 90°F, provided the relative humidity averages 65 to 70 percent in the barn over a 24-hour period. In normal weather during the tobacco curing season in Kentucky, the outdoor temperature seldom goes above 90° or below 60°F for any great length of time. Therefore, favorable curing conditions depend largely on whether relative humidity can be kept around 65 or 70 percent.

c. Cured tobacco leaves are very sensitive to changes in the moisture content of surrounding air and can be used to roughly determine relative humidity in the barn (see transparency master 31.2.2a). When samples feel "dry to low case," the humidity is about right for best curing.

This section taken from Harvesting and Curing Burley Tobacco.

31.2.3 Air curing.

a. Curing conditions in the barn can be varied by management practices. How well you cure your crop depends largely on how well you regulate humidity, how close you space sticks, the width of your barn, the size of the tobacco, and the amount of ventilation.

b. During August and September the air is usually dry during the day and moist at night; therefore, generally open the ventilators as soon as the dew dries in the morning and close them in late afternoon.

c. If you are not sure whether to open or close the curing barn, put a few cured leaves in a sheltered place, such as an open shed near the tobacco barn, and when these leaves are damp and hang limp, the air is high in moisture and the barn should be closed. In general, whenever these leaves feel drier than the tobacco inside the barn, the ventilators should be opened, but when the tobacco inside the barn feels drier than those leaves outside, then keep the barn tightly closed (see transparency master 31.2.2a).

d. During cool periods, open the barn to get the benefit of the warmer outside air. In cool weather the temperature may be 10°F lower in a closed barn than outside because of cooling from evaporation. If no fire is used in curing, provide as much ventilation as possible until curing is nearly complete.

e. If the weather is very dry and your tobacco is curing too fast, close the barn in the daytime and open it at night. This method traps the cool, moist night air and keeps the drier daytime air out of the barn.

f. During some periods every year, relative humidity cannot be adequately controlled by ventilators, and heat should be used. Also, whenever tobacco remains in case for more than 24 hours, houseburning will start. If you are unable to manage the barn ventilators properly as described, it is best to put the tobacco in the barn and leave all doors and ventilators open for 4 to 6 weeks. After the tobacco is cured, close the barn and leave it closed.

This section taken from Harvesting and Curing Burley Tobacco.

31.3 Supplementary Materials

References:

1. Curing Bright Tobacco in Bulk Barns, Publication 459.
2. Harvesting, Curing, and Marketing Burley Tobacco, Publication 416.
3. Harvesting and Curing Burley Tobacco, AGR-14.
4. UK Ag Report - Special Tobacco Edition.

Transparency Master: 31.2.2a, "Feel or Condition of Cured Tobacco Flyings in Relation to Relative Humidity."

31.4 Check-Out Activities

a. Provide students with the following exercise:

1. The final quality of cured burley tobacco is determined largely by chance. T F
2. The colors change during curing in burley tobacco. T F
3. Ideal curing conditions would have the tobacco to dry out each day and come into case each night. T F
4. As long as artificial heat is not used, tobacco will not dry too fast. T F
5. How would you use the windows or ventilators in curing tobacco?

ANSWERS:

1. False
2. True
3. True
4. False
5. Normally they are opened in the daytime to take in the warm dry air and closed at night to keep out the cool moist air. If the tobacco is drying too fast such as during very hot weather, the procedure may be reversed, closing the barn during the day and opening it at night.

b. Provide students with a barn with ventilators and have them cure tobacco according to the latest recommendations of the University of Kentucky Agricultural Experiment Station.

FEEL OR CONDITION OF CURED TOBACCO FLYINGS IN RELATION TO RELATIVE HUMIDITY

Feel of Cured Lead	Relative Humidity (Percent)
High case	90 to 100
Medium to high case	85 to 90
Medium case	80 to 85
Low to medium case	75 to 80
Low case	70 to 75
Dry to low case	65 to 70
Dry	60 to 65
Dry to brittle	55 to 60
Brittle	50 to 55
Fragile	0 to 50

Source: Harvesting and Curing Burley Tobacco.

32. CURING TOBACCO USING HEAT

32.1 Performance Objective

Given a written check-out activity concerning curing tobacco using heat, students will complete the activity with 80 percent accuracy.

32.2 Teaching-Learning Activities

a. This section on curing tobacco using heat can best be taught using the problem-solving procedure. Prepare appropriate lessons for class use.

b. Use extension personnel or others familiar with heating and energy problems as resource persons.

c. Take field trips to see different methods of heating barns.

d. Stress safety in heating especially since the heaters are to be near tobacco that can burn.

32.2.1 Controlling humidity with heat.

a. Heat is used primarily to control the moisture content of the air surrounding the tobacco in the barn. If too much heat is added, the moisture level of the air becomes too low, resulting in too fast a cure. If the weather dries the cured leaves each day without fire, then firing is a waste of fuel and time.

b. Always practice care and good management when using supplementary heat. Control the rate of heat to keep the temperature 85 to 90°F directly above the burner at the lowest level of tobacco. You should use each burner so that the temperature does not vary more than 15°F throughout the barn. Make all temperature measurements at the lowest level of the tobacco.

c. Normally, the side ventilators of the barn are mostly closed when heat is being used. As the warm, dry air rises through the tobacco, it absorbs moisture released by the tobacco. The moist air must not then be allowed to accumulate in the barn. Therefore, some ventilators will have to be partially opened to allow the moist air to escape.

This section taken from Harvesting and Curing Burley Tobacco.

32.2.2 Fuels and stoves

a. Use a number of stoves with low or moderate fires rather than a few stoves burning with high fires. This will distribute the heat better and minimize hot spots. Coke stoves made from 55-gallon oil drums release too much heat near the stove, cause hot spots, and result in green or "off" colors being set in the tobacco.

b. Also, though coke is commonly used, considerable labor is required to tend a coke-fired barn properly. Coke stoves must be started outside the barn and then moved in after the fires are started. They further require attention at least twice a day.

c. When properly used, one ton of coke, on the average, will cure one acre of tobacco. Follow these suggestions: 1) Avoid extremely hot fires since they will destroy the stoves and cause poor heat distribution; 2) After the curing season, remove the ashes and coke from the stoves, coat the stoves thoroughly with crankcase oil inside and out, and store in a dry place (coke stoves, when properly cared for, will last ten years or longer).

d. Natural gas is an excellent fuel for use in tobacco barns and, where available, is more economical than any other non-solid fuel that has proved satisfactory for tobacco. All natural gas supplied through commercial pipelines is safe for use in tobacco barns. Gas from most private wells is also pure enough for use in tobacco barns. The harmful impurity in natural gas is sulfur, usually in the form of hydrogen sulfide, which is easily detected by its foul odor. Gas with as little as one part per million of hydrogen sulfide will have a foul odor.

e. Propane gas or LP gas costs slightly more than natural gas or coke. It lights instantly, is easily controlled, and is a constant and uniform source of heat. Labor requirements for firing with propane are comparable to those for natural gas and both of them are much lower than coke.

f. When properly used, gas stoves will last ten years or longer. However, after the curing season, store the stoves in a dry place and store the hoses in a dark, dry place also.

This section taken from Harvesting and Curing Burley Tobacco.

32.2.3 Distribution of heat

Hot spots will frequently occur in localized areas directly above the stoves. These hot spots indicate poor heat distribution which, in turn, causes green or "off" colors in the tobacco. Hot spots are usually caused by over-firing and/or too few stoves. Moving the stoves from place to place in the barn does not solve the problem. You get uniform heat distribution only by using an adequate number of stoves, each burning at a moderate rate. If you use coke, put at least two stoves per bent, and sometimes three to a bent, in an average width barn (36-44 feet wide). All stoves should have some sort of heat spreader.

When using the larger gas burner, use one stove per bent. Each arm is slotted so that heat will escape at the proper intervals, giving good heat distribution. To check the heat distribution in the barn, use thermometers, hygrometers, and/or humidistats.

This section taken from Harvesting and Curing Burley Tobacco.

32.3 Supplementary Materials

Reference: Harvesting and Curing Burley Tobacco, AGR-14.

32.4 Check-Out Activities

Provide students with the following exercise:

1. It is better to use large stoves with high capacity to dry tobacco. T F
2. Coke is a commonly used fuel even though it requires a great deal of labor. T F
3. One ton of coke will dry approximately one acre of tobacco. T F
4. Natural gas is a good fuel where available. T F
5. Since the air in the barn is not breathed by humans, natural gas containing sulphur may be burned. T F
6. Hot spots are often caused by over-firing and/or too few stoves. T F

ANSWERS:

1. False
2. True
3. True
4. True
5. False
6. True

33. SEEDING WITH A COVER CROP

33.1 Performance Objective

a. Given a written check-out activity concerning seeding with a cover crop, students will complete the activity with 80 percent accuracy.

b. Given a field with the tobacco crop harvested, small grain seed and the necessary seeding equipment, the student will seed the tobacco land with a small grain. The grain will be evenly sown at the recommended rate over the entire field without skips or heavy concentrations. The variety and rate will agree with Extension Service recommendations.

33.2 Teaching-Learning Activities

a. This section on seeding with a cover crop can best be taught using the problem-solving procedure. Prepare appropriate lessons for class use.

b. Take a field trip to observe fields with cover crops. You might also point out erosion on fields not covered by a cover crop.

c. Provide students with a tobacco field after the tobacco has been harvested, the necessary seed, and seeding equipment. Have students sow a cover crop on the tobacco land. Check for accuracy.

33.2.1 Importance of cover crops.

Cover crops are essential where tobacco is to be grown in the same field for more than one year. Through their use a tobacco producer is able to save and carry over to next year's crop most of the soluble nutrients, such as nitrogen and potash, not used by the current crop. In this way, with proper fertilization, fertility of the land can be increased from year to year. Cover crops also help prevent erosion.

33.2.2 Sowing cover crops.

Cover crops should be sown as early as possible after the tobacco is removed from the field for the greatest benefit. The most commonly used cover crops following tobacco are wheat, barley, rye and oats. For best results, about 1½ to 2 bushels of seed per acre should be sown.

33.3 Supplementary Materials

References: 1. Burley Tobacco Production . . . In Tennessee, Publication 358.

2. UK Ag Report - Special Tobacco Edition.

33.4 Check-Out Activities

a. Provide students with the following exercise:

1. Why do we use a cover crop?
2. What types of cover crops should be used?
3. What are rates of seeding required for the above crops?
4. Cover crops are essential where tobacco is to be grown more than one year in the same area. T F
5. Cover crops should be sown as early as possible after the tobacco is removed from the field. T F

ANSWERS:

1. a. To save soluble nutrients
   b. To prevent erosion
   c. To increase fertility of the land
2. Small grains, wheat, barley, rye, oats
3. 1½ to 2 bushels per acre
4. True
5. True

b. Have students seed a cover crop and evaluate them according to the latest recommendations of the University of Kentucky Agricultural Experiment Station.

34. PREPARING THE STRIPPING ROOM

34.1 Performance Objective

a. Given a written check-out activity concerning preparing the stripping room, students will complete the activity with 80 percent accuracy.

b. Given a stripping room, cleaning and repair materials, and a source of heat and lights, the student will prepare the stripping room for tobacco. The stripping room will be cleaned and repaired; the table be the specified width, height and length; and adequate lighting and heating will be provided. The completed preparations will satisfactorily pass the instructor's checklist.

34.2 Teaching-Learning Activities

a. This section on preparing the stripping room can best be taught using the problem-solving procedure. Prepare appropriate lessons for class use.

b. Obtain copies of blueprints for tobacco stripping rooms from the reference, List of Plans for Tobacco Barns and Equipment, Publication AEN-5. Discuss the blueprints with the students. Explain the construction procedures and advantages of a newly constructed stripping room. Discuss the feasibility of remodeling older stripping rooms compared to the construction of a new one.

c. Provide students with the reference, UK Ag Report - Special Tobacco Edition, UK College of Agriculture. Have students read the article at the top of page 15. Discuss the article in class after the students have finished reading.

d. Show students the transparency master 34.2a, "Hourly Variations in the Quality of Daylight on Selected Days During the Burley Marketing Season." Discuss the chart with the class.

e. Provide the students with a stripping room in need of preparation for the tobacco crop, cleaning materials, repair materials and a source of lighting and heating. Have the students make the necessary repairs and preparations for stripping the tobacco crop. Compare the students' performance with the instructor's checklist. Students must score at least 90 percent on the checklist (see transparency master 34.2a).

34.2.1 Planning a stripping room

a. A stripping room should be large enough to accommodate the workers. It should be equipped with a stripping table, proper lighting and provisions for heating.

20

b. Proper stripping and sorting cannot be done without proper lighting. The best source of lighting is artificial light, such as fluorescent tubes. There should be one fixture per worker with preference for two 40-watt deluxe cool white or one 40-watt deluxe cool white tube and one 40-watt daylight tube. Fixtures should be 48 inches in length, should be located 3½ to 4 feet above the table, and should be set one inch back from the front edge.

c. If electricity is not available, skylights or side windows should be used. Northern exposure to light has proved to be best.

d. The stripping table should be just high enough for taller workers, usually about 36 inches, and should be approximately 4½ to 5 feet wide. The stripping table and background surfaces should be painted light neutral gray with a flat finish. This will provide the correct reflection of light onto the tobacco.

e. The stripping room should be cleaned of all trash and debris so that none is allowed to get onto the tobacco or cause a safety hazard.

34.3 Supplementary Materials

References:
1. Harvesting, Curing, and Marketing Burley Tobacco, Publication 416.
2. List of Plans for Tobacco Barns and Equipment, AEN-5.
3. Recommendations for Grading Tobacco Under Fluorescent Light Source, Progress Report 154.
4. UK Ag Report - Special Tobacco Edition.

Other: Blueprints of stripping rooms.

Transparency Masters:
1. 33.2a, "Hourly Variation in the Quality of Daylight on Selected Days During the Marketing Season for Burley Tobacco."
2. 33.2b, "Performance for Preparing Stripping Room for Tobacco."

34.4 Check-Out Activity

a. Provide students with the following exercise:

1. Name three things that should be included in a stripping room.
2. Each worker should have a light. T F

3. If natural light is used, a southern exposure is best.
   T F

4. The stripping table should be about _______ inches high
   and _______ feet wide.

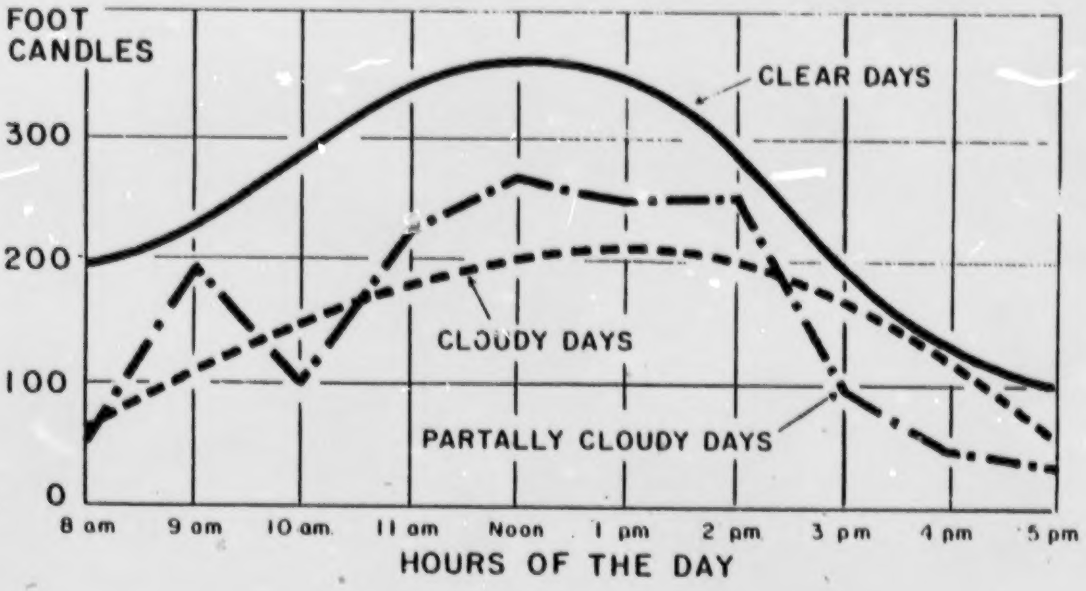
5. The stripping table should be painted white to help reflect
   light. T F

ANSWERS:

1. a. Stripping table
   b. Proper lighting
   c. Provisions for heating
2. True
3. False
4. a. 36 inches
   b. 4½ to 5 feet
5. False

b. Give students a stripping room to prepare. Check them out using transparency master 34.2b to see that they have done it correctly.

HOURLY VARIATION IN THE QUANTITY OF DAYLIGHT ON SELECTED DAYS DURING THE MARKETING SEASON FOR BURLEY TOBACCO



Source: Recommendations for Grading Tobacco Under Fluorescent Light Source.

TM 34.2a

PERFORMANCE FOR PREPARING STRIPPING ROOM FOR TOBACCO

(Instructor's Checklist)

Task Accomplished 10 points - Each Task

___ Yes ___ No 1. Provisions made for providing a safe heating system.

___ Yes ___ No 2. Stripping table 36 inches high.

___ Yes ___ No 3. Stripping table 4½ to 5 feet wide.

___ Yes ___ No 4. One fluorescent light fixture provided per worker.

___ Yes ___ No 5. Two 40-watt cool white or daylight fluorescent bulbs supplied for each fixture.

___ Yes ___ No 6. Light fixture hung 3½ to 4 feet above the stripping table.

___ Yes ___ No 7. Skylights or side windows provided if electricity is not available.

___ Yes ___ No 8. Adequate room provided for workers.

___ Yes ___ No 9. Trash and debris cleaned from stripping room.

___ Yes ___ No 10. Stripping table and background painted light neutral gray with a flat finish.

(Add others as necessary)

11.

12.

35. SELECTING MARKETING METHOD

35.1 Performance Objective

Given a written check-out activity concerning selecting marketing method, students will complete the activity with 80 percent accuracy.

35.2 Teaching-Learning Activities

a. This section on selecting marketing method can best be taught using the problem-solving procedure. Prepare appropriate lessons for class use.

b. Develop and show a slide presentation showing different methods of stripping tobacco and comparing loose leaf and hand tied.

c. Take a field trip to observe a farmer who is using the loose leaf method.

d. Take a field trip to observe a farmer who is using hand tying.

e. Use extension personnel or a farmer to compare the two methods.

35.2.1 Packaging and handling burley tobacco at the barn.

a. The mechanization of production and marketing procedures for burley tobacco has experienced little change during the past 50 years. Burley tobacco continues to require large amounts of hand labor with minimum mechanization. Both the availability and cost of intensive hand labor required at peak seasons are forcing many producers to seek labor-saving techniques.

b. About one-half of the labor required for the production of burley tobacco involves stripping and preparation for market. Leaves of air cured burley tobacco are removed from the stalk, held in an oriented fashion and tied with a wrapper leaf into "hands" or bundles. Burley tobacco producers and tobacco research personnel have logically reasoned that considerable labor and time might be saved if burley tobacco could be successfully marketed in an untied or loose-leaf form. Flue-cured tobacco is marketed in a loose-leaf, unoriented manner, packaged in a burlap sheet. Canadian and other types of tobacco are packaged and marketed in a compressed bale. Interest by many producers in loose-leaf packaging of burley tobacco has increased in recent years. Research on loose-leaf methods for burley tobacco and exploratory packaging of burley tobacco in loose-leaf forms have coincided with this increased interest.

c. Information is available from controlled experiments on labor requirements for packaging by conventional and loose-leaf methods, on moisture variables in the loose-leaf package, and on the technical and mechanical aspects of loose-leaf handling. Two major domestic manufacturers have cooperated in the evaluation of loose-leaf burley tobacco relative to the handling and manufacturing aspects from warehouse floor through the processor.

d. Several aspects of loose-leaf versus conventional handling of burley tobacco have not been thoroughly considered. For example, the effect of loose-leaf burley on export sales has not been evaluated. One might reason that there would be an advantage if the price were more competitive or a disadvantage if less useful. While American burley is in demand for the export markets because of its high quality, price per pound is always a factor.

e. Loose-leaf packaging and marketing of burley tobacco would represent a departure from traditional methods of handling a type of tobacco which has been presented for sale in hand-tied form since 1904. The initial response to such a change may be foreseen in part by recognizing the problems or difficulties such a change might cause. Examples of potential problem areas include: producers having to learn how to handle loose-leaf burley and bear the costs of acquitition of new equipment and materials to make the change; and warehousemen, graders, and buyers having to adapt to evaluating a new package of burley tobacco. On the other hand, there are probable advantages to loose-leaf packaging such as lower production costs and easier physical handling of packages through the trade channels.

This section taken from Packaging and Handling Burley Tobacco in Bales at the Farm.

35.3 Supplementary Materials

References:
1. Burley Tobacco Production Costs, Leaflet 344.
2. Packaging and Handling Burley Tobacco in Bales at the Farm, ID-39.
3. Preparing Burley Tobacco for Market, Circular 579A.
4. Tobacco Reporter Magazine.
5. UK Ag Report - Special Tobacco Edition.

35.4 Check-Out Activities

Provide students with the following exercise:

1. One advantage of loose-leaf tobacco is that manufacturers will pay more for it. T F

2. The impact of loose-leaf and demand for it is not totally understood especially in foreign markets. T F

3. There is some resistance to change from hand-tying because it has been done basically the same way since 1904. T F

4. Handling loose-leaf tobacco requires about 50 percent more labor than hand-tying. T F

5. Once stripped, bales of tobacco can be handled with less labor than hand-tied tobacco. T F

ANSWERS:

1. False
2. True
3. True
4. False
5. True

36. BULKING TOBACCO

36.1 Performance Objective

a. Given a written check-out activity concerning bulking tobacco, students will complete the activity with 80 percent accuracy.

b. Given a crop of cured burley tobacco hanging in a tobacco barn, an area for bulking tobacco, and the necessary covering material, the student will bulk tobacco for stripping. The bulk will be of adequate size and located near the stripping room, as recommended by the University of Kentucky Agricultural Experiment Station.

36.2 Teaching-Learning Activities

a. This section on bulking tobacco can best be taught using the problem-solving procedure. Prepare appropriate lessons for class use.

b. Take a field trip to watch a tobacco producer bulk a crop of burley.

c. Have the students list in order the steps followed in making the bulk.

d. Provide an opportunity for the students to gain experience in removing tobacco from the barn and bulking it for stripping. Provide the students with the necessary materials and equipment. Check for accuracy.

36.2.1 Bulking tobacco

a. Tobacco should not be allowed to hang indefinitely in the barn. The result is loss of weight and quality. It is desirable to remove the crop from the barn as soon as it is ready and conditions permit.

b. Tobacco is ready for bulking and stripping when the leaves and stems are fully cured and the top leaves, when in light case, break cleanly from the stalk. In light case, the top leaves do not feel dry, containing only enough moisture to make them pliable.

c. Time to bulk tobacco is when it comes in case during a rainy period. To bulk, the tobacco is removed from the sticks and piled in a double rick with the tips overlapping in the middle and the butts of the stalks to the outside. Tobacco is in proper case for bulking when the stem or mid-rib has sufficient moisture so it will not break easily, but before the leaf becomes moist.

d. Tobacco should not be bulked during a heavy fog or after it becomes high in case. It may result in the tobacco heating in the bulk, causing damage to the leaves.

e. In the early fall, when the stalks are not yet dried, tobacco may heat in the bulk if left for more than three or four days. Only enough tobacco should be bulked for three or four days of stripping. Tobacco on the lower rails may be in case in the early morning, enabling enough to be taken down each morning to provide for a day's stripping.

f. Tobacco should be bulked on a good platform or floor heavy enough to prevent it from absorbing moisture or earthy odor from the ground. Cover the bulk with a tarpaulin, old blanket, or a thin layer of sticks to prevent drying and breakage and to keep the tobacco clean. Plastic covers are sometimes used, but caution should be observed because of moisture condensation on the plastic.

Taken from UK Ag Report: Special Tobacco Edition.

36.3 Supplementary Materials

References:
1. Burley Tobacco Production . . . In Tennessee, Publication 358.
2. Harvesting and Curing Burley Tobacco, AGR-14.
3. Preparing Burley Tobacco for Market, Circular 579A.
4. UK Ag Report - Special Tobacco Edition.

36.4 Check-Out Activities

a. Provide students with the following exercise:

1. Tobacco will not lose any weight or quality as it continues to hang in the barn after curing. T F
2. Tobacco tends to turn darker each time it comes in case and goes out. T F
3. It is desirable to remove the crop from the barn as soon at it is ready and conditions permit. T F
4. In warm weather tobacco may be bulked sooner. T F
5. If the tobacco stalks are not dry, it is unsafe to bulk for 48 hours. T F

ANSWERS:

1. False
2. True
3. True
4. False
5. True

b. Have students bulk tobacco and check them out according to the latest recommendations of the University of Kentucky Agricultural Experiment Station.

37. STRIPPING AND GRADING ACCORDING TO MARKET DEMAND

37.1 Performance Objective

a. Given a written check-out activity concerning stripping and grading according to market demand, students will complete the activity with 80 percent accuracy.

b. Given some tobacco that is ready for stripping and information on market demands, student will strip, sort and tie the tobacco into hands. Sorting will be done according to University of Kentucky Agricultural Experiment Station recommendations and local standards of quality.

37.2 Teaching-Learning Activities

a. This section on stripping and grading according to market demand can best be taught using the problem-solving procedure. Prepare appropriate lessons for class use.

b. Take a field trip to observe tobacco being properly stripped and sorted by grade.

c. Have a tobacco grading contest for each class studying this unit.

d. Take a field trip to a tobacco warehouse to see various grades of tobacco and if possible determine price of various grades.

e. Use a Federal Tobacco Grader as a resource person.

f. Make and use transparencies and/or handouts using transparency masters at the end of this section.

37.2.1 Stripping and putting tobacco in hands.

a. A stripping room should be large enough to accommodate the workers and equipped with a stripping table, adequate lighting and provision for heating. The stripping table should extend the full length of the room, about 36 inches from the floor and 4½ to 5 feet deep. A top of three-inch slatted material or hardware cloth is suggested.

b. Wall-mounted tobacco presses are recommended. One press should be provided for every two strippers. Presses can be made on the farm and are relatively inexpensive.

c. Proper stripping and sorting cannot be done without proper lighting. The best source is artificial light, with a fixture containing two 40-watt fluorescent tobacco tubes placed at a height of about 3½ feet above the table. If electricity is not available, skylights provide good lighting. They should be on the north side of the roof directly over the stripping table. The next best light is provided by side windows, located on the north side of the room in the side wall, with the bottom of the window sash six to eight inches above the stripping table and with the windows extending the full length of the table. Tilting the tops of the windows six inches toward the table improves lighting conditions. The stripping table and background surfaces reflect light onto the tobacco and should be painted light neutral gray with a flat finish.

d. The process of stripping and sorting brings together leaves of like groups, color and quality from different stalks of tobacco. Proper stripping and sorting are important if the grower is to obtain the best price for his crop. When properly sorted into grades according to group, color and quality, leaf buyers are better able to obtain their specific needs.

e. The stripped leaves are tied into uniformly-sized hands with heads about as big as a silver dollar. Larger hands may mold or rot in storage. A leaf of the same grade is used as a tie-leaf and is wrapped around the stem end of the leaves. It should not extend farther than two inches from the butt of the leaves.

Taken from UK Ag Report: Special Tobacco Edition.

37.2.2 Sorting tobacco by grades and putting hands on sticks (See transparency masters 37.2.2a, 37.2.2b and 37.2.2c.)

a. The first leaves stripped are those at the base of the stalk. For burley, these are known as Flyings (X group) and are recognized by their thin body and by a considerable degree of injury, which is characteristic of leaves grown near the ground. They are also shorter than leaves produced higher on the stalk, except the tip leaves. For a good presentation of grades and a list of definitions, see Official Standard Grades: Burley Tobacco.

b. Next above the Flyings are the Lugs (C group), usually the longest and widest on the plant. They are thin to medium in body and do not have the injury characteristic of the lower leaves. Lugs usually cure with an open face, with the stem at or near the center of the leaf.

c. The rest of the leaves, which generally fall in the Leaf group (B group), fold like a book when cured, with the stem at the side. This factor aids in recognizing the Leaf group and is helpful in separating Lugs and Leaf.

d. The leaves of the Leaf group vary considerably in length, with the uppermost, or tip leaves, being the shortest. If there is a high percentage of short leaves--less than 16 inches long--they should be separated. These are graded as Tips (T group).

e. In dark air-cured and fire-cured tobacco, the smaller ground leaves at the bottom of the plants make up the X group known as Lugs. The C group, called Thin Leaf or Seconds, is composed of fairly sound leaves of good size, but lacking in body and fill. The B group, the Heavy Leaf grades, are the large, heavier-bodied leaves that generally represent about 60 percent of the crop in a good season. The T group, or Tips, are leaves shorter than 16 inches in length. The short leaves should always be separated from the other leaf grades.

f. Usually six to eight leaves are tied in each hand of dark-fired tobacco. Dark air-cured, both Green River and One Sucker, should be tied in hands of 15 to 20 leaves.

g. Practically all crops of tobacco are different. Some will have three to four grades, while others will have as many as seven or eight grades when the groups are properly sorted according to qualities and colors. Crops should be sorted into as few grades as possible, but normally not less than three.

h. Often leaves may cure green or be off-colored due to houseburn, sunburn and bruising. These leaves, when mixed with well-colored tobacco, will usually cause the grade and price to be lowered. When separated, they may be graded as non-descript (N group), mixed (M group), or if predominantly of one group, may be described as green (G), variegated (K), or other color designations.

i. Recent trends have resulted in burley tobacco being sorted into fewer grades. Some growers have been stripping their crops into one grade, which is graded as mixed (M group). The practice of mixing tobacco may have the advantage of a slight saving in labor, but the mixed tobacco does not meet the needs of manufacturers or leaf dealers. Mixed tobacco may sell at a lower price than well sorted tobacco, especially on a weak market displaying an abundant supply of well sorted, good quality leaf.

j. Hands of the various groups of stripped tobacco should be placed on separate sticks, with 12 to 14 hands per stick. When a stick is filled, it should be placed in the press and pressed lightly. Tobacco in high case, however, should not be pressed. Flyings and Lugs may be pressed a little more firmly than the Leaf.

k. If the stripped tobacco is in high case, it should be bulked in a "chicken coop" for several days until it is in safe keeping order. A "chicken coop" bulk is one which has an open center with sticks placed east, west, north and south, with the butts turned outward.

l. The tobacco should then be placed in a solid bulk and covered carefully to protect it from dirt and trash and to prevent drying out.

m. The sticks of stripped tobacco may be sorted into their respective grades in preparation for hauling to the warehouse for sale, or the sorting may be done at the warehouse floor. However, when sorted at the farm, the tobacco can be unloaded directly onto the baskets at the warehouse.

Taken from UK Ag Report: Special Tobacco Edition.

37.3 Supplementary Materials

References:
1. Harvesting and Curing Burley Tobacco, AGR-14.
2. Official Standard Grades: Burley Tobacco.
3. Recommendations For Grading Tobacco Under Fluorescent Light Source, Progress Report 154.
4. UK Ag Report: Special Tobacco Edition.

Transparency Masters:
1. 37.2.2a, "A Typical Tobacco Plant."
2. 37.2.2b, "Stripping and Sorting Burley Tobacco."
3. 37.2.2c, "Key to Standard Grade Marks."
4. 37.2.2d, "Summary of Standard Grades For Burley Tobacco, Type 31."

37.4 Check-Out Activities

a. Provide students with the following exercise:

1. A-frame tobacco presses are recommended. T F
2. Proper stripping and sorting cannot be done without proper lighting. T F
3. Natural light from a window facing south is best. T F
4. Stripping tables should be painted white to give more reflection. T F
5. It is important to sort tobacco into grades since different grades are used for different purposes. T F
6. Ungraded tobacco (mixed grade) may be hard to sell when a good supply of good quality graded tobacco is available. T F
7. The first leaves removed at the base of the stalk are called tips (T group). T F
8. Just below the flyings are the lugs (C group). T F

9. Short leaves should always be separated from other grades.
T F

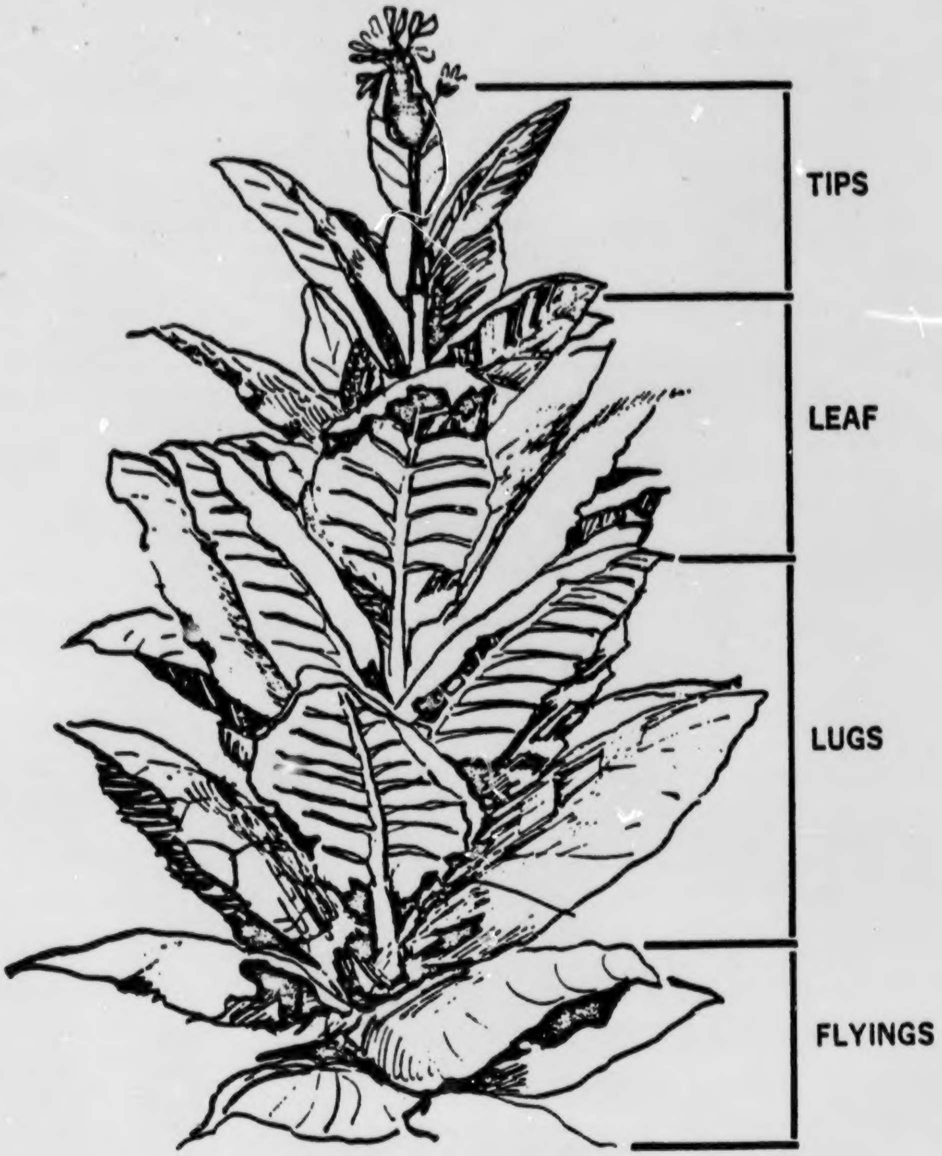
10. The number of grades tobacco needs to be sorted varies greatly depending on the qualities and colors of the tobacco.
T F

ANSWERS:

1. False
2. True
3. False
4. False
5. True
6. True
7. False
8. False
9. True
10. True

b. Have students strip, sort and tie tobacco into hands. Grading and size of hands will agree with the latest recommendations of the University of Kentucky Agricultural Experiment Station.

A TYPICAL TOBACCO PLANT


TIPS
LEAF
LUGS
FLYINGS

Source: Burley Tobacco Production . . . In Tennessee.

STRIPPING AND SORTING BURLEY TOBACCO

FLYINGS - LEAVES AT BASE OF PLANT, THIN-BODIED, CONSIDERABLE DEGREE OF INJURY, SHORTER THAN ALL OTHER LEAVES EXCEPT TIPS.

LUG OR CUTTERS - LONGEST AND WIDEST LEAVES ON THE PLANT, THIN TO MEDIUM BODIES, NO INJURY CHARACTERISTICS, CURE OPEN FACED WITH THE STEM AT OR NEAR THE CENTER OF THE LEAF.

***LEAF** - CURES CLOSED FACED LIKE A BOOK, HEAVY-BODIED LEAVES, TAN COLORED OR RED.

***TIPS** - SHORT LEAVES AT THE TOP OF THE PLANT LESS THAN 16 INCHES LONG.

*CAN BE GROUPED INTO ONE GRADE = LEAF.

KEY TO STANDARD GRADE MARKS

GROUPS

X - FLYINGS
C - LUGS OR CUTTERS
B - LEAF
T - TIPS
M - MIXED
N - NONDESCRIPT
S - SCRAP

QUALITIES

1 - CHOICE
2 - FINE
3 - GOOD
4 - FAIR
5 - LOW

COLORS

	R - RED		
L - BUFF	D - DARK RED	V - GREENISH	G - GREEN
F - TAN	K - VARIEGATED	VF- GREENISH TAN	GF- GREEN TAN
FR - TANNISH RED	M - MIXED	VR- GREENISH RED	GR- GREEN RED

Source: Official Standard Grades: Burley Tobacco.

SUMMARY OF STANDARD GRADES FOR BURLEY TOBACCO, TYPE 31

14 Grades of Flyings

X1L	X1F		
X2L	X2F		
X3L	X3F		
X4L	X4F	X4M	X4G
X5L	X5F	X5M	X5G

21 Grades of Lugs or Cutters

C1L	C1F				
C2L	C2F				
C3L	C3F	C3K	C3M	C3V	
C4L	C4F	C4K	C4M	C4V	C4G
C5L	C5F	C5K	C5M	C5V	C5G

35 Grades of Leaf

B1F	B1FR	B1R							
B2F	B2FR	B2R		B3K	B3M	B3VF	B3VR	B3GF	B3GR
B3F	B3FR	B3R	B4D	B4K	B4M	B4VF	B4VR	B4GF	B4GR
B4F	B4FR	B4R	B5D	B5K	B5M	B5VF	B5VR	B5GF	B5GR
B5F	B5FR	B5R							

21 Grades of Tips

T3F	T3FR	T3R						
T4F	T4FR	T4R	T4D	T4K	T4VF	T4VR	T4GF	T4GR
T5F	T5FR	T5R	T5D	T5K	T5VF	T5VR	T5GF	T5GR

8 Grades of Mixed Group

M1F	
M2F	
M3F	M3FR
M4F	M4FR
M5F	M5FR

7 Grades of Nondescript

N1L	N1F	N1R	N1G
N2L		N2R	N2G

1 Grade of Scrap

S

Special factors "U" and "W" may be applied to all grades.
Tobacco not covered by the standard grades is designated as No-G.

Source: Official Standard Grades: Burley Tobacco.

38. HANDLING TOBACCO FROM STRIPPING TO MARKETING

38.1 Performance Objective

a. Given a written check-out activity concerning handling tobacco from stripping to marketing, students will complete the activity with 80 percent accuracy.

b. Given a certain amount of stripped, tied tobacco and/or baled or sheeted tobacco, the student will check for keeping ability of the tobacco, determine the size and kind of book in which the tobacco is to be placed, and determine the method to be used in covering the book. Use the latest recommendations of the University of Kentucky Agricultural Experiment Station as the standard by which to evaluate the students' work.

38.2 Teaching-Learning Activities

a. This section on handling tobacco from stripping to marketing can best be taught using the problem-solving procedure. Prepare appropriate lessons for class use.

b. Show students how to determine the keeping ability of leaf after it has been stripped.

c. Develop and show slides of handling tobacco from stripping to marketing.

d. Arrange a field trip to a nearby farm so students can observe the proper methods of placing stripped (hand-tied and/or loose leaf) tobacco in books and of covering and loading tobacco to be transported to market.

38.2.1 Pressing and bulking hand-tied tobacco for market.

a. Prepare a good platform for your stripped tobacco before stripping it. Use tobacco presses to improve the appearance of your tobacco. Presses can be made on the farm and are relatively inexpensive. They are usually placed on the walls of a stripping room. Have one press for every two strippers. As you fill each stick (preferably 12 or 14 hands), place it in a press and leave it there until you fill the next stick. After you take the sticks from the press, place them in bulk and cover the bulk. Do not cover tightly with plastic cover. Press your tobacco according to its group. Never press when tobacco is in high order.

b. Flyings and lugs may be pressed a little firmer than the leaf groups. Tobacco pressed too solidly is difficult to inspect, and often the leaf surface will be bruised. Properly pressed tobacco bulks smoother, and air spaces which cause it to dry out and collect dirt are reduced. It also packs more evenly on baskets, presents a neat appearance, and gives an impression of careful preparation.

Taken from Preparing Burley Tobacco for Market.

38.2.2 Sorting stripped hand-tied tobacco

When your tobacco has been stripped, the next operation is to sort the sticks of stripped tobacco into their respective groups. Each group then should be matched in regard to quality and color. Sort in daylight or under fluorescent lighting, never by yellow (Mazda) electric or lantern light.

38.2.3 Storage of baled tobacco on the farm.

a. Store the bales in the barn area on plastic, wood, or a similar base as with hand-tied tobacco to protect from soil contact and moisture uptake. Beginning against a post, wall, or partition, stack the bales upright on an edge just as removed from the press to maintain squareness and a neat, uniform shape. Laying some boards or plywood across the top of the first layer will allow a second layer of bales to be stacked on edge.

b. NOTE: Stacking bales flat more than two high is not advised for long storage periods (more than 1 day) as the bottom bales will usually be mashed out of shape (except for the drier tobacco in very firm bales).

c. Stored tobacco can be covered with tarps, etc., for protection as is done with regular hand-tied and bulked tobacco.

d. Check the stacked bales periodically for general condition and safe keeping of the tobacco.

38.2.4 Check firmness of bales.

The proper "firmness" or "tightness" of any bale can be checked on the farm at the time of making bales (direct from the stripping room and above 32°F tobacco) as follows:

a. Compare the size, weight, and moisture content with research results reported elsewhere in these instructions.

b. Lay a sample bale flat on a smooth, solid base. Stack three similar bales on top of the first bale. If the stack remains nearly vertical for 24 hours, then the bottom bale is "firm" enough. If the top of the stack leans 2 to 4 inches or more or topples after 24 hours, the bottom bale is too loose and soft. Repack and press tighter.

c. CAUTION: For tobacco too moist (high "case" or "order"), the tobacco can be pressed too tightly, resulting in "bruised" or "caked" leaves and possibly lowering the market value of the tobacco.

Allow the tobacco to dry to normal "case" or "order" before baling. Be sure that modified or non-standard bale press equipment does not exceed the compression force of 1,000 to 1,200 pounds.

Taken from Packaging and Handling Burley Tobacco in Bales at the Farm.

38.3 Supplementary Materials

References:
1. Preparing Burley Tobacco for Market, Circular 579A.
2. Packaging and Handling Burley Tobacco in Bales at the Farm, ID-39.

38.4 Check-Out Activities

a. Provide students with the following exercise:

1. An excessive amount of moisture will cause tobacco to heat after it has been stripped. T F
2. Very dry tobacco will cause tobacco to heat after it has been stripped. T F
3. It is best to prevent the stripped tobacco from drying out after it has been stripped. T F
4. Tobacco should be pressed when it is in high order. T F
5. If tobacco is pressed too solidly, it may be hard to inspect. T F
6. Pressing too solidly may bruise the leaf surfaces. T F
7. One advantage of bales is that they can be stored on the ground. T F
8. Another advantage of bales is that they can be stacked several bales high, thus saving storage space. T F
9. Stored bales should be covered as is done with regular hand-tied and bulked tobacco. T F
10. Stacked bales should be checked periodically. T F

ANSWERS:

1. True
2. False
3. True
4. False
5. True
6. True
7. False
8. False
9. True
10. True

b. Provide the students with stripped tobacco which is tied, baled, or sheeted. Have each student check for keeping ability, determine the size and kind of book in which to place the tobacco, and determine the method to be used for covering the book. Evaluate the student according to the latest recommendations of the University of Kentucky Agricultural Experiment Station.

39. SELECTING MARKETS

39.1 Performance Objective

a. Given a written check-out activity concerning selecting markets, students will complete the activity with 80 percent accuracy.

b. Given a number of tobacco markets in a 50-mile area, the student will select the market that has the most advantages for the tobacco producer in terms of price and service.

39.2 Teaching-Learning Activities

a. This section on selecting markets can best be taught using the problem-solving procedure. Prepare appropriate lessons for class use.

b. Take a field trip to a tobacco warehouse to learn about warehouse personnel, warehouse charges (auction fee and commission on gross sale), warehouse policies and related items.

c. Prepare a chart or overhead transparency showing warehouse charges, auction fee, commission on gross sale and total cost of selling tobacco per pound. Use latest Kentucky Tobacco Market Report and Review.

d. Use resource persons from the University of Kentucky or local persons connected with tobacco such as persons from a tobacco warehouse.

39.2.1 Tobacco markets.

a. The 1978 burley tobacco crop in Kentucky was marketed through 219 sales floors in 30 market centers. Marketing facilities for burley are distributed across the state in about the same geographic pattern as production. The dark tobaccos are sold in 10 market centers. Seven handle dark air-cured and three handle fire-cured tobacco. (See transparency master 39.2.1a.)

b. The marketing system for tobacco has not changed substantially for many years. The system was developed to provide the services for assembling the production from many small growers, displaying each producer's crop in lots according to farm grade and providing auction services for selling tobacco.

c. The costs to the producer of marketing burley tobacco vary from one market to another. Most auction sales warehouses have an auction fee and commission on gross sales. A few charge just one or the other. In 1978 a majority of auction fees fell in the range of $ .50 to $1.00. The extremes were $ .00 to

$5.75. A majority of commission fees ran between 3.5 and 4.5 percent. (See transparency master 39.2.1b.)

d. The 1978 burley tobacco crop was highlighted by improved quality and higher grade prices. Volume was about 2 million pounds lighter than the year before. Loan receipts amounted to 11.4 percent of sales compared with 9.7 percent last season. Some tobacco was sold in baled loose-leaf form with a support price for the first time this season. Averages increased mainly $7 to $13 per hundred for most grades. Top average for 1978 was $139 per hundred for B1F. Producers' sales at auction totaled 591.7 million pounds and averaged $131.18 per hundred. Last season 590 million pounds returned $120.09 per hundred. (See transparency masters 39.2.1c and 39.2.1d.) Quality was better as the percentage of good and fair tobacco increased with less low, nondescript and no-grade. Also, more lugs were sold while tips and mixed offerings decreased. Agricultural Stabilization and Conservation Service records of the U. S. Department of Agriculture show approximately 28 million pounds of burley declared carryover this year and will be deducted from the 1979 crop quota. The loan level for the 1979 crop based on the formula used in the past would be $133.3 per hundred pounds - up $8.6 from last season.

e. The marketing system for dark tobaccos is similar to that described for burley. Ten marketing centers are available for the dark types, handling about 25 million pounds per year on the average.

f. For many years a part of the fire-cured tobacco crop has been sold directly to manufacturers and dealers. Buyers visit the barns of producers prior to the marketing season and purchases are negotiated. Producers selling at their farms deliver tobacco directly to the purchaser's place of business.

39.2.2 Selecting a market.

In deciding on a market, a farmer must look at selling costs such as transportation costs to different locations, time required to travel the various distances to markets, and warehouse costs. A farmer must try to predict returns from various markets by looking at marketing reports and using past experience. After taking the costs from the returns and considering other factors such as convenience, the farmer will choose a market.

39.3 Supplementary Materials

References: 1. *Kentucky Tobacco Market Report and Reviews*, latest edition.

2. *UK Ag Report - Special Tobacco Edition*.

Transparency Masters:

1. 39.2.1a, "Opening and Closing Dates of the Burley Marketing Season, Sales Floors and Buyers of Tobacco Sold at Auction in Kentucky by Market."
2. 39.2.1b, "Auction Sales Warehouse Charges on Burley Markets 1978-79 Season in Kentucky."
3. 39.2.1c, "Gross Auction Sales, Value and Average Price by Markets of Burley Tobacco in Kentucky."
4. 39.2.1d, "Producers' Sales, Value and Average Price of Burley Tobacco at Auction in Kentucky."

39.4 Check-Out Activities

a. Provide students with the following exercise:

1. It is best to sell tobacco at the closest market. T F
2. Marketing charges are the same at all markets in Kentucky. T F
3. The best market is the one with the lowest marketing costs. T F
4. Four percent of a total selling price of $2,000 is ______.
5. There are about 30 market areas in Kentucky. T F
6. The marketing system for dark tobaccos is similar to that for burley. T F
7. Some fire-cured tobacco is sold right on the farm. T F
8. Selling fees generally consist of an auction fee of so much per hundred pounds plus a percent of the gross sales value. T F

ANSWERS:

1. False
2. False
3. False
4. $80
5. True
6. True
7. True
8. True

b. Give the students a list of tobacco markets in a 50-mile area and information about each. Have students select the best market based on the information given them.

OPENING AND CLOSING DATES OF THE BURLEY MARKETING SEASON, SALES FLOORS AND BUYERS OF TOBACCO SOLD AT AUCTION IN KENTUCKY BY MARKET

Market and State	1978 1/					
	Mkts.	Opening dates	Closing dates	Sales days	Sales floors	Buyers
	No.					(Sets)
Kentucky:						
Bloomfield		Nov. 20	Jan. 15	22	4	1
Bowling Green		Nov. 20	Jan. 18	26	9	2
Carrollton		Nov. 20	Feb. 12	39	7	2
Covington		Nov. 20	Jan. 25	27	2	1
Cynthiana		Nov. 20	Jan. 31	33	12	1
Danville		Nov. 20	Jan. 31	33	8	1
Franklin		Nov. 20	Jan. 17	20	4	1
Glasgow		Nov. 20	Jan. 17	23	6	2
Greensburg		Nov. 20	Jan. 11	21	3	1
Harrodsburg		Nov. 20	Feb. 1	34	8	1
Henderson		Nov. 20	Jan. 25	6	1	- 4/
Hopkinsville		Nov. 20	Jan. 18	24	7	1
Horse Cave		Nov. 20	Jan. 16	24	11	2
Lebanon		Nov. 20	Jan. 16	24	5	1
Lexington		Nov. 20	Mar. 8	49	37	5
London		Nov. 20	Jan. 11	21	4	1
Louisville		Nov. 20	Feb. 5	34	3	2 3/
Mayfield		Nov. 21	Jan. 23	9	3	1 3/
Maysville		Nov. 20	Jan. 31	32	17	3
Morehead		Nov. 20	Jan. 30	30	4	-
Mt. Sterling		Nov. 20	Jan. 29	26	4	1
Owensboro		Nov. 20	Jan. 24	29	11	2 4/
Paducah		Nov. 20	Jan. 25	22	3	- 3/
Paris		Nov. 20	Jan. 25	30	8	1
Richmond		Nov. 20	Jan. 23	27	7	1
Russellville		Nov. 20	Jan. 18	21	7	1
Shelbyville		Nov. 20	Feb. 12	38	10	2
Somerset		Nov. 20	Jan. 11	21	2	1
Springfield		Nov. 20	Jan. 22	27	6	1
Winchester		Nov. 20	Jan. 25	30	6	1
Total	30				219	41

Source: Tobacco Market Review: Light Air-Cured Burley - Type 31, 1978 Crop.

AUCTION SALES WAREHOUSE CHARGES ON BURLEY MARKETS 1978-79 SEASON IN KENTUCKY

Market	Sales floors	Auction Fee 1/	Commission on gross sales
		Dollars	Percent
Bloomfield	3	--	4.75
	1	1.00	4.0
Bowling Green	4	1.00	4.0
	2	1.50	4.5
	2	1.20	4.5
	1	1.50	3.5
Carrollton	5	.75	4.5
	1	.80	4.5
	1	.60	4.75
Covington	2	1.00	4.5
Cynthiana	11	.75	3.5
	1	--	3.75
Danville	8	.75	3.75
Franklin	4	.60	4.5
Glasgow	6	1.00	5.0
Greensburg	3	--	6.0
Harrodsburg	6	.75	3.75
	2	1.00	4.0
Henderson	1	1.00	5.0
Hopkinsville	7	.50	5.0
Horse Cave	9	1.00	5.0
	2	1.00	4.5
Lebanon	3	4.50	--
	2	5.00	--
Lexington	8	.50	4.0
	7	--	4.0
	6	.35	4.0
	4	.75	3.75
	3	1.00	4.5
	3	5.75	--
	2	5.00	--
	2	.75	4.0
	2	.75	3.5
London	4	1.00	4.25
Louisville	3	1.00	4.5
Mayfield	3	1.00	5.0
Maysville	4	5.00	--
	4	.75	3.5
	4	.95	4.0
	3	.75	3.85
	2	.75	3.75
Morehead	4	1.00	4.0
Mt. Sterling	4	.60	4.0
Owensboro	11	1.00	4.5
Paducah	3	1.00	5.0
Paris	5	.75	3.5
	3	--	4.0
Richmond	4	.50	4.0
	2	--	4.0
	1	5.30	--
Russellville	7	.60	4.5
Shelbyville	9	.50	4.5
	1	.80	4.0
Somerset	2	1.00	4.0
Springfield	6	--	4.75
Winchester	3	.60	4.0
	2	.50	4.0
	1	.60	3.75

1/ Rate per hundred pounds; basic charges; some markets have additional charges for weighing small baskets, insurance, etc.

Source: Tobacco Market Review: Light Air-Cured Burley - Type 31, 1978 Crop.

GROSS AUCTION SALES, VALUE AND AVERAGE PRICE BY MARKETS OF BURLEY TOBACCO IN KENTUCKY

Market	1978 Crop 1/		
	Sales	Value	Average price
	Pounds	Dollars	Dollars
Bloomfield	6,212,410	8,168,245	131.48
Bowling Green	12,359,708	16,105,474	130.31
Carrollton	31,304,451	4[illegible]15,115	132.62
Covington	4,435,206	[illegible]03,255	130.85
Cynthiana	14,143,994	[illegible]85,808	134.94
Danville	13,252,723	17,377,933	131.13
Franklin	3,634,038	4,712,662	129.68
Glasgow	18,912,537	24,934,169	131.84
Greensburg	13,624,635	18,108,017	132.91
Harrodsburg	10,984,951	14,537,583	132.34
Henderson	192,698	224,499	116.50
Hopkinsville	9,582,454	12,232,980	127.66
Horse Cave	17,625,282	23,280,222	132.08
Lebanon	13,872,226	18,377,208	132.47
Lexington	90,834,290	119,399,991	131.45
London	7,786,228	10,118,418	129.95
Louisville	9,738,637	12,630,024	129.69
Mayfield	2,879,734	3,703,698	128.61
Maysville	33,019,774	43,728,045	132.43
Morehead	10,526,936	13,912,271	132.16
Mt. Sterling	15,635,720	20,829,324	133.22
Owensboro	15,504,608	20,084,461	129.54
Paducah	4,041,967	5,162,454	127.72
Paris	10,298,211	13,747,155	133.49
Richmond	14,034,506	18,626,847	132.72
Russellville	6,332,250	8,131,373	128.41
Shelbyville	29,442,884	39,210,120	133.17
Somerset	9,269,753	12,146,659	131.04
Springfield	13,528,580	17,949,491	132.68
Winchester	12,502,254	16,439,710	1[illegible].49
Total Kentucky	455,513,645	600,283,211	131.78

1/ Includes all burley tobacco, baled and tied.

Source: Tobacco Market Review: Light Air-Cured Burley - Type 31, 1978 Crop.

PRODUCERS' SALES, VALUE AND AVERAGE PRICE OF BURLEY TOBACCO AT AUCTION IN KENTUCKY

Crop	Sales	Value	Average Price
	Pounds	Dollars	Dollars
1968	387,979,827	286,214,888	73.77
1969	415,716,688	290,273,685	69.82
1970	385,280,574	278,070,193	72.17
1971	327,037,502	265,600,576	81.21
1972	413,652,105	328,561,974	79.43
1973	311,533,862	290,789,715	93.34
1974	427,339,456	488,259,394	114.26
1975	434,442,424	463,792,826	106.76
1976	455,294,536	524,007,121	115.09
1977	397,168,577	484,353,487	121.95
1978	403,411,703	531,758,041	131.82

Source: Tobacco Market Review: Light Air-Cured Burley - Type 31, 1978 Crop.

40. FEDERAL REGULATIONS FOR TOBACCO

40.1 Performance Objective

Given a written check-out activity concerning Federal regulations for tobacco, students will complete the activity with 80 percent accuracy.

40.2 Teaching-Learning Activities

a. This section on Federal regulations of tobacco can best be taught using the problem-solving procedure. Prepare appropriate lessons for class use.

b. Take a field trip to the county office of the Agricultural Stabilization and Conservation Service to learn where the office is located, become better informed about programs they administer, services they offer, ASC county committees, and to become acquainted with the ASCS personnel.

c. Use ASCS office personnel or ASC committee persons or cooperative extension service personnel as resource persons to discuss Federal regulations.

40.2.1 Basic legislation affecting tobacco programs.

a. The production of tobacco in Kentucky is regulated by Federal programs. Burley tobacco production is controlled by a poundage quota-price support program. An acreage allotment-price support program controls the production of fire-cured tobaccos, types 22 and 23, and dark air-cured tobaccos, types 35 and 36.

b. The basic legislation for both programs is the Agricultural Adjustment Act of 1938 as amended.

Taken from UK Ag Report: Special Tobacco Edition.

40.2.2 Burley tobacco program.

a. National marketing quotas.

The poundage legislation requires the Secretary of Agriculture to announce by February 1 the amount of the national marketing quota for that crop year. The national marketing quota is set at the amount produced in the United States which the Secretary estimates will be utilized in the United States and will be exported during the marketing year and then adjusted, either upward for the purpose of maintaining an adequate supply, or downward for effecting an orderly reduction of supplies to the reserve supply level. The reserve supply level is the amount of tobacco considered as adequate for use in domestic and export markets and to maintain stocks for aging. In burley, the reserve supply level is about 2.8 years use. Any downward adjustment in quotas cannot exceed 3 percent of the estimated amount for domestic use plus exports.

b. Farm marketing quotas.

Individual farms receive a farm marketing quota based on their share of the national marketing quota.

c. Under-marketing and over-marketing.

Producers are permitted to carry forward quotas for under-marketings and over-marketings. Penalties are provided when over-marketings exceed 110 percent of the farm marketing quota. The maximum that can be carried forward from under-marketings is 100 percent of the quota. Producers who have produced more than 110 percent of their quota may arrange to have the tobacco processed and stored after agreeing on grade and price. They can then receive payment for the tobacco after the following October 1. All tobacco handled this way is deducted from the farm quota in the following year.

Any over- or under-production of quota including leased-in quota is carried forward to the following year, even during those years when a producer referendum is held to determine if quotas are to be continued. For example, the 1980 crop will be the last crop produced until a new referendum is held. If producers approve quotas for 1980, 1981, and 1982, over- and under-marketings from the 1979 crop will be carried forward to 1980.

d. Leasing.

Leasing of quotas is permitted between producers within counties, but no producer can lease-in more than 15,000 pounds per year per quota. Leases may be negotiated for up to five years. All leases must be recorded in the local ASCS offices where the program is administered. Producers seeking information on leasing should contact their local ASCS offices. Any farmer can lease-in quota whether or not he/she owns land with quota. The over- or under-production on the leased quota counts against the following year farm allotment of the party leasing-in the quota. Producers who do not own land with quotas are not permitted the 10 percent tolerance in over-marketings. Leasing is permitted during the marketing season so that producers who are over and under quotas may lease-in and out.

A producer is permitted to both lease-in and lease-out during the same year, but to prevent speculation, a producer who leases prior to Ausust 1 cannot take an opposite position until after August 1. Leasing-in and out by the same producer is not permitted after August 1.

e. Price support.

The current method of determining price supports has been in effect since the 1961 crop. Price supports are determined as follows: The base price is the 1959 support level (57.2c per pound). This base price is adjusted in accordance with the change in the index of prices paid by farmers, including interest, taxes and wage rates in 1959, and the average of the prices paid index for the three calendar years proceding the year for which the support level is being determined. In other words, the average of the three years prices paid index is divided by the 1959 index and the result is multiplied by the 1959 support price (57.2c per pound) to arrive at the support price for the crop year desired.

f. Continuance of program.

The legislation states that if marketing quotas have been effective on a poundage basis, the Secretary of Agriculture shall, not later than February 1 of the last year of three consecutive marketing quotas are in effect, proclaim national marketing quotas for burley tobacco for the next three succeeding marketing years. Within 30 days following such proclamation, a referendum is held to determine if producers are in favor of quotas. At least two-thirds of the producers voting in a referendum must favor quotas in order for the program to be in effect. Burley farmers will vote in a referendum in February or early March, 1980, to determine whether or not they want the poundage control-price support program for burley tobacco for the crop years of 1980, 1981, and 1982.

Adapted from UK Ag Report: Special Tobacco Edition.

40.2.3 Program for dark tobacco.

a. The control program for fire-cured and dark air-cured tobacco is based on farm acreage allotments. In most other respects, the program is generally similar to that for burley. It is an acreage allotment-price support program.

b. Dark air-cured and fire-cured tobaccos are grown principally in Kentucky and Tennessee. Each year the national acreage allotments are announced by February 1. For the 1975 crop of Kentucky-Tennessee fire-cured (types 22 and 23) tobacco, the national acreage allotment was 33,072 acres. For dark air-cured (types 35 and 36) tobacco, the national acreage allotment was 12,025 acres. Individual farms receive a farm acreage allotment based on their share of the national allotment.

c. The method of determining price support for fire-cured and dark air-cured tobacco is the same as that for burley, beginning with the 1961 crop.

d. Lease and transfers of allotments are provided for in the program, but since acreage allotments are the basis for control, under- and over-production cannot be carried forward in dark tobaccos as in burley. Leases and sales of dark tobacco allotments are limited to transactions between allotment holders in the same county.

e. The provision for continuance of the program is essentially the same as for burley tobacco.

f. Under the acreage allotment program previously used in burley and currently used for dark tobaccos, the incentive was to produce maximum yields on the allotted acres. The shift to poundage quotas for burley, with provisions to carry forward under and over production of quotas, provides an important insurance factor in that unused quota can be leased out or produced in the following year. However, the shift to poundage quotas apparently reduced the incentive to maximize production, since the burley quota has not been produced in any year since the program was changed from acreage allotments to poundage quotas.

g. Kentucky tobacco farmers have historically favored the control-price support programs as an aid in the orderly marketing of this commodity that plays such an important part in the agricultural economy of the state.

40.3 Supplementary Materials

Reference: UK Ag Report: Special Tobacco Edition.

40.4 Check-Out Activities

Provide students with the following exercise:

1. The poundage legislation requires the Secretary of Agriculture to announce by February 1 the amount of the national marketing quota for that year. T F
2. A producer may lease-in 18,000 pounds per year per quota. T F
3. A landowner may produce 10 percent more than his/her base in any year. T F
4. Both national and farm marketing quotas are set each year. T F
5. Referendums are held every three years to determine if marketing quotas will be continued. T F
6. In a referendum vote, at least 75 percent of producers voting must favor quotas to keep them in effect. T F
7. Kentucky tobacco farmers have historically favored the control-price support programs. T F

8. Dark tobaccos are controlled by poundage quotas. T F

9. Leases of quotas must be recorded in the register of deeds office. T F

10. Leases may be signed for up to five years. T F

ANSWERS:

1. True
2. False
3. False
4. True
5. True
6. False
7. True
8. False
9. False
10. True

41. TRANSPORTING TOBACCO TO MARKET AND SELLING TOBACCO

41.1 Performance Objective

a. Given a written check-out activity concerning transporting tobacco to market and selling tobacco, students will complete the activity with 80 percent accuracy.

b. Given 1,000 pounds of tobacco that has been stripped (tied and/or loose leaf), the student will load, haul, and make delivery to tobacco warehouse. Tobacco will be unloaded at the warehouse and weighed.

41.2 Teaching-Learning Activities

a. This section on transporting tobacco to market and selling tobacco can best be taught using the problem-solving procedure. Prepare appropriate lessons for class use.

b. Develop a slide program depicting loading, hauling, and selling tobacco, and use it in class.

c. Show students a government grading card.

d. Show students tickets that are placed on tobacco.

e. Take a field trip to a tobacco market to observe tobacco being brought in, properly placed on baskets, graded, and sold.

f. Obtain various warehouse forms and show students how they are used and filled out. Be sure and get copies of forms that list government support prices.

g. Make and use transparencies and/or handouts from transparency masters at end of this section.

h. Use extension or warehouse personnel as resource persons to discuss loading, hauling, unloading, tickets, grading, and selling tobacco.

41.2.1 Loading stripped hand-tied tobacco.

a. After the sticks of tobacco have been carefully sorted and checked, they should be packed on the truck in the following order: first the sticks of the lowest quality flyings and then the next quality and so on are on top. Next, load the high quality lugs. The leaf is then loaded, beginning with that of the highest quality and, then, in order of quality to the lowest.

b. Be careful in loading so that no leaves are crumpled or otherwise injured. Also, place a marker of some kind between each group or quality of groups so they can be kept separate. This makes them much easier to identify when the crop is unloaded on the warehouse floor. Tobacco can be badly mixed when it is unloaded for sale, since this work is often done by careless or inexperienced helpers. The use of markers for each lot will help prevent mixing of tobacco when it is unloaded for sale. Unload directly on the basket at the warehouse; this eliminates a lot of shattering.

Taken from Preparing Burley Tobacco for Market.

41.2.2 Unloading stripped hand-tied tobacco and placing it on the warehouse floor for sale.

a. At the sales floor each lot should be placed on a separate basket. It is recommended that the baskets of tobacco be arranged on the warehouse floor so that they will be sold in the following order:

(1) Lowest quality flyings first and then in order of quality to the best flyings.
(2) Lugs in order of quality from highest to lowest.
(3) Leaf grades in sequence from the highest to lowest quality.

b. How your tobacco is arranged for sale at auction may greatly influence your returns. If your tobacco is sold in order of quality, it assists both the starter and the buyer. Tobacco so displayed is more attractive and usually sells better than that laid out for sale without regard to group or quality.

Taken from Preparing Burley Tobacco for Market.

41.2.3 Arranging crop on baskets for sale.

a. The size or weight of lots offered for sale is important. Extremely large lots are sometimes regarded with suspicion. On the other hand, very small lots are undesirable to warehouse personnel and buyers. A small basket of tobacco will occupy as much floor space as a basket of maximum weight.

b. The size of the lots will depend on the acreage grown and the range of quality, color, and length. Ordinarily, lots should weigh not less than 100 pounds, and lots of more than 700 pounds are not allowed. It is advisable to keep small lots of each stripping at home until enough of each grade is accumulated to make up a lot of marketable size rather than to permit several small lots of different quality to be placed on one basket. In packing tobacco on baskets, care should be taken that the tobacco presents a neat appearance. Properly sorted, neatly prepared, and correctly arranged lots of tobacco sell at the highest current market prices.

Taken from Preparing Burley Tobacco for Market.

41.2.4 Loading and hauling tobacco bales.

The bales can be manually loaded onto any vehicle suitable for hauling hand-tied tobacco. Practice the same management techniques and precautions for protection of the bales from contamination and weather as you would with hand-tied tobacco. Bales can generally be stacked flat 4 to 5 high for same-day or overnight hauling and unloading trips without appreciable distortion of the bottom bales, especially if the bales have been properly made. Handling bales with frozen or dried edges will cause greater shatter losses than when the edges are kept moist and pliable (in normal "case" or "order").

Taken from Packaging and Handling Burley Tobacco in Bales at the Farm.

41.2.5 Delivering and selling burley bales.

a. The currently approved experimental bale program for 1978 specifies that each burley auction warehouse can have three sales for bales in each of three weeks preceding the normal Christmas holiday recess and two sales in two separate weeks after the normal Christmas holiday recess. Thus, each producer will need to check with the warehouse where he plans to take his tobacco for dates of delivery and these sales.

b. The handling and loading of the burley bales at the farm should be done similar to the normal handling of hand-tied tobacco. Use a clean bed vehicle that will not contaminate the tobacco. Stack the baled tobacco three to five bales high with the bales laid flatways to form a stable load. Use ropes if necessary to secure the load onto the vehicle.

c. Be sure each bale has a tag securely attached showing the owners name and indicating a farm grade. This tag is necessary for proper grouping and accountability of your tobacco at the warehouse.

d. Cover the loaded tobacco with a tarp or suitable material for wind and other protection on the way to the warehouse.

e. At the warehouse, instructions will be available on the method of stacking the bales on baskets and other pertinent details. Generally, up to seven bales of the same farm grade will be stacked onto a basket. You may have some baskets with only one or two bales. This lot of tobacco will be weighed as is normally done and a fare weight deducted for the cotton tie twine weight.

f. The baskets of bales will be lined up on the warehouse floor, probably in a special area of bales only, until sale time.

g. In preparation for federal grading, a warehouse representative will open a particular bale in a lot of tobacco chosen by a grader for inspection. The producer is responsible for certifying that the bale inspected is representative of the grade of all the tobacco in that lot, that the leaf was stalk-cured, that the bales do not contain any foreign matter or material and that the bales are not nested.

h. After grading, the bales will be sold by auction in the same manner as conventional hand-tied tobacco.

41.2.6 Selling hand-tied tobacco.

a. Prior to sale, the tobacco is inspected and graded by a federal tobacco grader and the support price for each lot of tobacco is established, based on the grade.

b. The actual sale of tobacco is by auction with the sale unit consisting of one warehouse personnel, an auctioneer and a "set" of buyers made up of buying representatives from each of the major tobacco companies, plus tobacco dealers. Tobacco that does not receive a bid of at least $1 above the support price is consigned to the Tobacco Growers Cooperative, which pays the producer and then processes and stores the tobacco for future sale. The producer has the privilege of rejecting the bid for his/her tobacco without paying sales charges.

c. The auction market for burley opens in late November. Sales are conducted four days per week. The markets recess for approximately two weeks during the Christmas holidays. The bulk of the crop is sold by the end of January.

d. The sale season for burley tobacco is related to and synchronized with the marketing of other types of tobacco--flue-cured, the dark types and Maryland--enabling Federal graders and company buyers to be at several market locations over the year and at markets for different types of tobacco.

e. Markets for dark air-cured tobacco usually open in early December and close in mid to late January. Fire-cured tobacco markets open in mid-January and close about a month later.

f. There are 39 complete sets of buyers on Kentucky burley markets, a set of buyers buying tobacco at several warehouses on a given market. The allocation of selling time among individual warehouses on a market is made by local boards of trade, with allocation usually based on the amount of selling space in each warehouse.

g. Regulations governing marketing operations permit sales for 3½ hours per day at a rate of 360 baskets per hour. The warehouses have the option of operating on a poundage basis, with maximum sales of 340,000 pounds per day per set of buyers, provided not more than 1,800 baskets are sold.

h. Warehouses choosing basket options and selling average-sized baskets of 425 pounds could sell approximately 535,000 pounds per set of buyers per day. At this rate of sale for each set of buyers, a typical Kentucky burley crop could be sold in about

20 sale days. However, the rate at which the crop can be sold is limited by the capacity of redrying plants and their capability to receive and process the leaf for storage after sale.

i. In 1970, auction sales were reduced from five to four days per week because the leaf could not be removed from sales floors and redried as rapidly as it was sold. The lengthy Christmas recess in sales normally permits redryers to process the backlog of leaf built up from earlier sales.

Taken from UK Ag Report: Special Tobacco Edition.

41.3 Supplementary Materials

References:
1. Official Standard Grades: Burley Tobacco.
2. Packaging and Handling Burley Tobacco in Bales at the Farm, ID-39.
3. Preparing Burley Tobacco for Market, Circular 579A.
4. UK Ag Report: Special Tobacco Edition.

41.4 Check-Out Activities

a. Provide students with the following exercise:

1. When loading the truck, the leaf should be loaded first. T F
2. Markers should be placed between each group or quality groups. T F
3. It is recommended that leaf grades be sold first. T F
4. How your tobacco is arranged may greatly influence your returns. T F
5. The size or weight of lots is important. T F
6. Bales may be stacked flat four or five high for same-day or overnight hauling without appreciable distortion of the bottom bales. T F
7. The producer is responsible for certifying that the bale of tobacco inspected is representative of the grade of all tobacco in that lot. T F

ANSWERS:

1. False
2. True
3. False
4. True
5. True
6. True
7. True

b. Give students 1,000 pounds of tobacco that has been stripped, and have students haul, make delivery to tobacco warehouse, unload and weigh. Check students out according to the latest recommendations of the University of Kentucky Agricultural Experiment Station.

LIST OF RESOURCES

Books

Approved Practices in Crop Production, 2nd ed., Elwood A. Brickbauer and W. P. Mortenson. The Interstate, Danville, Illinois, 1978. 395 pages.

Crop Production, 4th ed., Richard J. Delorit, Louis J. Greub, and Henry L. Ahlgren. Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1974. 744 pages.

Kentucky Agricultural Statistics, 1977-1978. Kentucky Crop and Livestock Reporting Service, Room 645 Old Post Office and Courthouse Building, P. O. Box 1120, Louisville, Kentucky 40201. Published annually. 145 pages.

Tobacco and Kentucky, W. F. Axton. The Kentucky Bicentennial Bookshelf. The University of Kentucky Press, Lexington, Kentucky, 1975. 149 pages.

1978 Handbook of Agricultural Charts, Agriculture Handbook No. 551. Superintendent of Documents, United States Government Printing Office, Washington, D.C., 1978 (updated regularly). 134 pages.

Kentucky Cooperative Extension Publications*

A Productive Tobacco Soil, Cir. No. 575-A, 1970. 12 pages.

Black Root Rot in Kentucky, AGR-35. J. H. Smiley, C. C. Litton, G. B. Collins, and I. E. Massie, 1974. 11 pages.

Burley Mechanization, Misc. Pub. 393, 1971. 22 pages.

Chemical Control of Weeds in Farm Crops in Kentucky, 1979, AGR-6. J. W. Herron and W. W. Witt. Revised annually. 24 pages.

Considering a Mechanical Tobacco Harvestor or Bulk Barn, Ag. Economics Notes.

Controlling Black Shank of Tobacco in Kentucky, AGR-77. J. H. Smiley, G. B. Collins, C. C. Litton, and Ira Massie, 1979. 10 pages.

*These are available free of charge from your county cooperative extension office or can be ordered in quantity (up to one per each two students in your largest class) through the Department of Vocational Education, University of Kentucky, Room 43 Dickey Hall, Lexington, Kentucky 40506.

Farm Manure: Production-Value-Use, ID-19. H. F. Miller, I. J. Ross, and G. W. Thomas, 1976. 3 pages.

Farm Planning Manual for Kentucky Farmers, Agricultural Economics Extension Information, Series No. 11. S. Q. Allen, Wilmer Browning, C. L. Moore, Sr., and D. L. Debertin, 1978. 101 pages.

Fertilizing Burley Tobacco, AGR-49. J. L. Sims, W. O. Atkinson, and H. F. Miller, 1976. 3 pages.

Harvesting and Curing Burley Tobacco, AGR-14, Ira Massie and Jones H. Smiley, 1974. 15 pages.

How to Take Good Soil Test Samples, AGR-16. D. E. Peaslee, K. L. Wells, H. F. Miller, and L. Murdock, 1977. 2 pages.

Kentucky Burley Tobacco Variety Tests, Progress Report 235. J. H. Smiley, A. M. Wallace, J. R. Calvart, G. B. Collins, and C. C. Litton, 1978. 11 pages.

Kentucky Farm Tobacco Research Report, Progress Report 195. J. H. Smiley, 1971. 24 pages.

KY 15: A New Burley Tobacco Variety With Multiple Disease Resistance, AGR-67. G. B. Collins, J. H. Smiley, C. C. Litton, and P. D. Legg, 1978. 3 pages.

KY 17: A Black Shank Resistant Burley Tobacco, AGR-68. G. B. Collins, J. H. Smiley, C. C. Litton, and P. D. Legg, 1978. 2 pages.

KY 171 Tobacco, AGR-25. C. C. Litton, G. A. Everette, G. B. Collins, and J. B. Masterson, 1973. 3 pages.

Liming Acid Soils, AGR-19, 1973. 2 pages.

List of Plans for Tobacco Barns and Equipment, AEN-5, 1975. 2 pages.

Manganese Toxicity in Burley Tobacco, AGR-22. J. H. Smiley, W. O. Atkinson, and Ira E. Massie, 1966. 2 pages.

Nitrogen in Kentucky Soils: Sources, Reactions, and Fertilization, AGR-43. Harold Miller, Kenneth Wells, and John Sims, 1975. 12 pages.

Packaging and Handling Burley Tobacco in Bales at the Farm, ID-39. George A. Duncan and J. H. Smiley, 1978. 19 pages.

Preparing Burley in Bales, ID-38. G. A. Duncan and J. H. Smiley, No date. 8 pages.

Preparing Burley Tobacco for Market, Circular 579-A. Ira Massie, George A. Everette, and J. H. Smiley, 1967. 19 pages.

Recommended Tobacco Varieties for Kentucky, AGR-13. J. H. Smiley, G. B. Collins, C. C. Litton, I. E. Massie, and G. A. Everette, 1979. 3 pages.

Removing Mold From Air-Cured Tobaccos, AGR-9. George A. Everette, D. L. Davis, and Garland S. Teague, 1972. 1 page.

Safeguard Yourself: When Using Insecticides, ENT-26. Wesley Gregory, 1974. 12 pages.

Soil Testing: What it is - What it Does, AGR-57. D. E. Peaslee, K. L. Wells, H. F. Miller, and L. Murdock, 1977. 2 pages.

Sucker Control Chemicals for Burley Tobacco, AGR-75. W. O. Atkinson, J. H. Smiley, and Ira Massie, 1972. 6 pages.

Tobacco Plantbed Management, AGR-38. Ira E. Massie, Jones H. Smiley, and W. O. Atkinson, 1975. 17 pages.

Tobacco Stalks and Stems: Fertility, Value, and Use, AGR-23. J. H. Smiley and W. O. Atkinson, 1979. 2 pages.

Urea as a Source of Fertilizer Nitrogen for Crops in Kentucky, AGR-69. K. L. Wells, L. W. Murdock, and H. F. Miller, 1978, 4 pages.

Use a Resistant Tobacco Variety, AGR-42. Ira E. Massie, J. H. Smiley, and George A. Everette, 1976. 3 pages.

Use Bluestone-Lime on Tobacco Plantbeds, AGR-74. Ira E. Massie and J. H. Smiley, 1979. 2 pages.

When to Apply Lime and Fertilizer, AGR-5. Kenneth Wells, 1972. 4 pages.

1979 Insecticide Recommendations for Tobacco Beds, ENT-14. Wesley Gregory, 1978. 2 pages. (Use latest edition.)

1979 Insecticide Recommendations for Tobacco Fields, ENT-15. Wesley Gregory, 1978. 7 pages. (Revised annually.)

1979 Lime and Fertilizer Recommendations, AGR-1. Revised annually. 17 pages.

Other Publications

Burley Tobacco Production . . . In Tennessee, Publication 358, Gilbert N. Rhodes and Joseph N. Matthews. Agricultural Extension Service, University of Tennessee, Knoxville, Tennessee, 1976. 28 pages.

Burley Tobacco - Transplanting to Harvest, Publication 293. Extension Service, Virginia Polytechnic Institute, Blacksburg, Virginia, 1969. 10 pages. Free.

Corn Production, Unit in this series, Clyde Grace, Jr., 1979. 198 pages.

Curing Bright Tobacco in Bulk Barns, Publication 459. Extension Service, Virginia Polytechnic Institute, Blacksburg, Virginia, 1972. 4 pages. Free.

Gardening - Groundskeeping, GG-10, "Applying Fertilizer." Curriculum Development Center, Competency Based Education Unit, Bureau of Vocational Education, 20th Floor, Capital Plaza Tower, Frankfort, Kentucky 40601, No date. 11 pages.

Gardening - Groundskeeping, GG-6, "Sterilizing Soil." Curriculum Development Center, Competency Based Education Unit, Bureau of Vocational Education, 20th Floor, Capital Plaza Tower, Frankfort, Kentucky 40601, No date. 11 pages.

Gardening - Groundskeeping, GG-1, "Taking Soil Samples." Curriculum Development Center, Competency Based Education Unit, Bureau of Vocational Education, 20th Floor, Capital Plaza Tower, Frankfort, Kentucky 40601, No date. 13 pages.

Harvesting, Curing, and Marketing Burley Tobacco, Publication 416. Extension Service, Virginia Polytechnic Institute, Blacksburg, Virginia, 1974. 8 pages. Free.

Nursery Production, NP-1, "Taking Soil Samples." Curriculum Development Center, Competency Based Education Unit, Bureau of Vocational Education, 20th Floor, Capital Plaza Tower, Frankfort, Kentucky 40601, No date. 13 pages.

Official Standard Grades: Burley Tobacco (U.S. Type 31). USDA, Agricultural Marketing Service, Tobacco Division, Washington, D.C., 1978. 23 pages.

The Golden Leaf, Pamphlet. The Kentucky Farm Bureau Federation, 120 South Hubbard Lane, Louisville, Kentucky 40207, Updated. Free.

Timely Tobacco Topics, TTT No. 24. Agronomy Department, University of Kentucky, Lexington, Kentucky 40506.

Tobacco Industry Profile, Updated annually. The Tobacco Institute, 1776 K Street, N. W., Washington, D.C. 20006. 6 pages.

Tobacco in the United States, Misc. Publication 867. USDA, Agricultural Marketing Service, Washington, D.C., 1973. 66 pages. $1.25.

Tobacco Market Review: Light Air-Cured Burley - Type 31, 1978 Crop, TOB-LA - 23. USDA, Agricultural Marketing Service, Washington, D.C., 1979. 27 pages.

Tobacco Production, Bul. No. 245. USDA, Washington, D.C., 1961. 58 pages. 45 cents.

Topping and Suckering Burley Tobacco, Publication 373. Extension Service, Virginia Polytechnic Institute, Blacksburg, Virginia, 1970. 4 pages. Free.

UK Ag Report - Special Tobacco Edition. Cooperative Extension Service, University of Kentucky, Lexington, Kentucky 40506, No date. 20 pages. Free.

1976 Virginia Weed-Disease Control Guide, CS-53. Extension Service, Virginia Polytechnic Institute, Blacksburg, Virginia, 1976. 11 pages. Free.

Slides and Slidefilms

"Calibrating and Applying Pesticides Safely," (52 slides or frames). Vocational Agriculture Service, College of Agriculture, University of Illinois, 434 Mumford Hall, Urbana, Illinois 61801. Price: Slides, $11.95; Slidefilm, $6.74.

"Identification of Weed Seedlings, Broadleaves," Parts I & II (90 slides total or 45 frames each). Vocational Agriculture Service, College of Agriculture, University of Illinois, 434 Mumford Hall, Urbana, Illinois 61801. Price: Slides, $19.80; Slidefilms, $5.40 each or $10.80 for both.

"Identification of Weed Seedlings, Grasses," (42 slides or frames). Vocational Agriculture Service, College of Agriculture, University of Illinois, 434 Mumford Hall, Urbana, Illinois 61801. Price: Slides, $9.25; Slidefilms, $5.04.

"Identifying Common Insect Pests," (73 slides or frames). Vocational Agriculture Service, College of Agriculture, University of Illinois, 434 Mumford Hall, Urbana, Illinois 61801. Price: Slides, $16.80; Slidefilm, $9.51.

"Selecting and Handling Pesticides," (62 slides or slidefilms). Vocational Agriculture Service, College of Agriculture, University of Illinois, 434 Mumford Hall, Urbana, Illinois 61801. Price: Slides, $16.60, Slidefilm, $8.19.

"Taking Soil Samples," GG-1 (slides with tape). Donna Brown, CBVE Unit, 21st Floor, Capital Plaza Tower, Frankfort, Kentucky 40601. Price: Slides, $4.00; Tape, $2.00.

"The Wicked World of Weeds," (77 slides or frames). Vocational Agriculture Service, College of Agriculture, University of Illinois, 434 Mumford Hall, Urbana, Illinois 61801. Price: Slides, $16.95; Slidefilm, $9.24.

"Understanding and Safe Use of Pesticides," (72 slides or frames). Vocational Agriculture Service, College of Agriculture, University of Illinois, 434 Mumford Hall, Urbana, Illinois 61801. Price: Slides, $16.60; Slidefilm, $9.39.

"Weed Identification," (78 slides or frames). Vocational Agriculture Service, College of Agriculture, University of Illinois, 434 Mumford Hall, Urbana, Illinois 61801. Price: Slides, $17.15; Slidefilm, $9.36.